

An implementation pilot of the MindBalance web-based intervention for depression in three IAPT services

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Abstract. Web-based interventions for depression have burgeoned over the past 10 years as researchers and health professionals aim to harness the reach and cost-effectiveness that the internet promises. Despite strong clinical evidence of their effectiveness and policy support, web-based interventions have not become widely used in practice. We explored this translation gap by conducting an implementation pilot of MindBalance, a web-based intervention for depression built on the SilverCloud platform, in three IAPT services. We posed three questions: (1) Who chooses to use MindBalance? (2) Is MindBalance effective for these clients? (3) How do clients use MindBalance? Our results for questions (1) and (2) are commensurate with the positive findings in the literature on patient acceptability and clinical effectiveness for such interventions. Client usage, captured in adherence data as well as usage case-studies, was diverse and differed markedly from face-to-face sessions. The most surprising result, however, concerned the small number of people who were offered the intervention. We reflect upon why this was and discuss implementation issues that primary mental health services should consider when adding a web-based intervention to their services.

Key words: Computerized CBT, depression, IAPT, web-based intervention

Introduction

Web-based interventions for depression have burgeoned over the past 10 years as researchers and health professionals aim to harness the reach and cost-effectiveness that the internet

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promises. Often grouped under the general term computerized cognitive behaviour therapy (CBT), a web-based intervention can be more explicitly defined as:

a primarily self-guided intervention program that is executed by means of a prescriptive online program operated through a website and used by consumers seeking health- and mental-health related assistance. The intervention program itself attempts to create positive change and or improve/enhance knowledge, awareness, and understanding via the provision of sound health-related material and use of interactive web-based components (Barak *et al.* 2009).

Web-based interventions are distinct from other therapeutic uses of the internet, such as online therapy, therapeutic software that can support assessment and monitoring, and other online activities, such as therapeutic blogging (see Barak *et al.* 2009 for helpful overview). However, within the field of web-based interventions there is also a substantial amount of heterogeneity. While most web-based interventions for common mental health problems are based on principles of CBT, the level of interactivity and human support varies with the design.

The Beacon directory, a comprehensive portal of web resources for mental health with evidence assessment, lists over 40 web-based interventions for depression alone and many more for other common mental health conditions. Many of these have shown good clinical effectiveness in trial settings, demonstrated through large trials of single systems (Christensen *et al.* 2004; Proudfoot *et al.* 2004) as well as a systematic review (Kaltenthaler *et al.* 2008a) and several meta-analyses and reviews that cover multiple systems (Spek *et al.* 2007; Andersson & Cuijpers, 2009; Foroushani *et al.* 2011). However, slow uptake in practice points to translation gaps between concept and clinical practice (Whitfield & Williams, 2004).

One of the early weaknesses of web-based interventions for depression was the high rate of non-completion (Christensen *et al.* 2009; Donkin *et al.* 2011). Researchers have addressed this through devising various engagement strategies. One of these is to make content interactive through the use of multimedia (e.g. videos) and responsive interaction (e.g. data visualization). Another strategy has been to introduce human support, such as via follow-up telephone calls or online reviews. Studies show that interactivity and human support increase adherence and clinical effectiveness (Ritterband *et al.* 2006; Spek *et al.* 2007; Resnicow *et al.* 2010). This research addresses what is often referred to as the Type 1 translation gap (see the Cooksey Review, 2006), i.e. that between the science of CBT and an appropriate technology (e.g. web-based intervention).

Nonetheless, web-based interventions have not become widely used in practice despite policy support (Layard, 2006; Department of Health, 2011) and their potential for addressing the cost-effectiveness challenge of providing high throughput talking therapies (Parry *et al.* 2011). The developing Improving Access to Psychological Therapies (IAPT) service model, which includes guided self-management, could be an appropriate access point for web-based interventions for depression. This suggests that there is also a Type 2 translation gap, namely that between clinically effective interventions and their common use in practice (the Cooksey Review, 2006).

We would argue that greater understanding is needed of the issues that arise when implementing a web-based intervention into a realistic primary-care setting. We report an implementation pilot in three IAPT services of MindBalance, a web-based intervention for depression built on the SilverCloud platform (Sharry *et al.* 2013). We pose the following questions: (1) Who chooses to use MindBalance? (2) Is MindBalance effective for these

clients? (3) How do clients use MindBalance? We use this data to reflect more generally on implementation of a web-based intervention into IAPT services.

Intervention description

The SilverCloud platform

SilverCloud is a media-rich, web 2.0 platform on which interactive web-based interventions for common mental health problems can be rapidly constructed. It was specifically designed to improve engagement through a number of design strategies drawn from research in human-computer interaction. These are described below and illustrated in [Figure 1](#).

Personal. Users are encouraged to draw together all strands of the intervention and build their own plan or ‘toolbox’ for staying well and managing current and future mood difficulties. While users can navigate through the pages one after the other, they can also choose to jump to particular sections to suit their needs.

Interactive. Users can engage with the range of media, such as interactive quizzes, video presentations, online exercises and activities, homework, and mobile diary-keeping. These are meant to encourage reflection and personalization of the information offered in the intervention.

Supportive. Although mainly self-directed, each user is assigned a supporter who provides feedback at specified intervals throughout the intervention on the activities that the user has chosen to share.

Social. Users can gain a sense of other people using the system by seeing how many people liked an activity, or by sharing answers to an activity that are visible to all after moderation.

Each module is structured in an identical way and incorporates introductory quizzes, videos, informational content, interactive activities, as well as homework suggestions and summaries. In addition, personal stories and accounts from other clients are incorporated into the presentation of the material. The design attempts to encourage engagement in a cost-effective manner through combining personal support with a highly interactive online intervention. Initial studies have demonstrated that SilverCloud has achieved clinical effectiveness with high rates of engagement and minimal therapist time in a university setting. A more detailed description, with multimedia appendix, is available in Sharry *et al.* (2013).

MindBalance

MindBalance is a seven-module intervention built on the SilverCloud platform, incorporating psycho-educational and therapeutic elements of managing difficulties with low mood and depression. The intervention draws primarily on the principles of CBT and incorporates elements of mindfulness.

The first two modules encourage the user to ‘tune in’ to their mood, behaviour and thought patterns and build their own feelings, thoughts and behaviour cycles. The remaining modules focus on supporting the user to challenge behavioural (physiological feelings) and cognitive (thoughts, memories, images, attention) aspects of any unhelpful cycles which they have identified for themselves. A module examining core beliefs can be made available to users

(a) Personal: The SilverCloud dashboard shows a user's profile, journal updates (e.g., "What Are You Thinking/Doing Today?", "Interview went better than I expected"), a list of tasks to do (e.g., "Return to last page viewed", "talk to my parents more"), and a progress bar for the "SilverCloud" program. The program progress section lists modules like "Getting Started with Mind Balance" and "Time In 1: Getting to Grips with Mood".

(b) Interactive: The "Tools" section for "Mindfulness" provides educational text and audio exercises. "Breathe" (2 min, 1 file) and "Body Scan" (3 min, 1 file) are highlighted with play buttons and progress indicators. Other exercises include "Have a Laugh" and "Sounds".

(c) Supportive: The "Thoughts, Feelings, Behaviours" cycle diagram illustrates the relationship between these elements. A "Situation / Trigger Event" (my friend never texted me back) leads to "Thoughts" ("she never texts me back, she doesn't care about me, this always happens with friends" - "Overgeneralising"), which leads to "Feelings" (rejection (R), worry (W), concerned (C)), then to "Behaviours" (I texted her again), and finally to "Physical Reactions" (feel kind of hollow) and "Outcomes" (Mood: I don't speak to my friend for a few days).

(d) Social: The "TFB Cycle" view shows a cycle named "My Friends" with a "View Cycle" button and a "View Thought Challenge" button. A "Your Cycles" sidebar shows "My Friends Cycle 2" and "Eg".

Fig. 1. Screenshots of MindBalance illustrating its main design concepts. (a) Personal; (b) Interactive; (c) Supportive; (d) Social.

Table 1. Description of MindBalance modules

Module name	Brief description
Getting Started	Outlines the basic premise of CBT, provides information about depression, and introduces some of the key ideas of MindBalance. Users are encouraged to begin to record their own current difficulties with depression.
Tune In I: Getting to Grips with Mood	Focuses on mood monitoring and emotional literacy. Users can explore different aspects of emotions, physical reactions, action and inaction, and how all of these concepts are related.
Tune in II: Spotting Thoughts	Focuses on noting and tracking thoughts. Users can explore the connection between their cognitions and their mood and record them graphically.
Change It I: Boosting Behaviour	Focuses on behavioural change as a way to improve mood, including ideas about behavioural activation. Users can plan and record activities, and chart their relationship with their mood.
Change It II: Challenge Your Thoughts	Encourages challenging distorted or overly negative thinking patterns. Users complete thought records, and receive illustrations of helpful coping thoughts.
Change It III: Core Beliefs	Outlines the role that deeply-held core beliefs can play in mood and depression. Users can use a range of interactive activities to identify, challenge and balance any unhelpful core beliefs.
Bringing It All Together	Users are encouraged to bring together all the skills and ideas they have gathered so far, note their personal warning signs, and make a plan for staying well.

who have completed the basic content. A more detailed description of module content is available in [Table 1](#).

MindBalance was developed as part of the Technology Enhanced Therapy project funded via the National Digital Research Centre in Ireland and has been developed in partnership between the Mater Community Adolescent Mental Health Service, Parents Plus and Department of Computer Science at Trinity College Dublin.

Service-based use

The MindBalance intervention was used as part of three IAPT services in the East of England. The IAPT service model provides high throughput talking therapies at two levels of intensity to the adult population. The high-intensity level provides therapy with a clinical psychologist or cognitive behavioural therapist and the low-intensity level provides guided self-help with a trained psychological wellbeing practitioner (PWP). The MindBalance intervention was offered as an option at the lower level of intensity as an alternative to manual-based guided self-help, and in some cases, group support.

Participants who chose to use MindBalance were given a log-in and a link to an introductory video familiarizing them with the intervention. Each participant received up to eight reviews on a weekly or fortnightly basis as agreed with the supporting PWP. The intervention did not run for more than 3 months. PWPs based their reviews on the shared support page which both participant and PWP could see in exactly the same form. Participants could share any activity that they engaged in, such as a thoughts-feeling-behaviours cycle, as well

Table 2. *Inclusion and exclusion criteria for study participation*

Inclusion criteria	Exclusion criteria
To receive treatment of depression with little or no comorbid anxiety	Are not comfortable reading in English
Appropriate for guided self-help in a primary-care setting as determined by current IAPT procedures	Do not have adequate reading ability to use a guided self-help intervention
Owns a computer and has access to broadband internet	Have had a CBT intervention within the past year

IAPT, Improving Access to Psychological Therapies.

as their journal entries. Activities were shared automatically, but participants could click a button to keep any particular activity private. Participants could also leave messages for their PWP.

PWPs reviewed each participant on a specified day listed on the shared page. They were encouraged to spend about 10 min reviewing a participant, giving them encouragement and if necessary pointing them towards specific parts of the intervention. They also responded to participants' questions. PWPs were discouraged from offering therapy online. Participants had continued use of MindBalance without PWP support for a further 4 months.

Those who chose manual-based guided self-help were provided a self-help manual and received up to six face-to-face or telephone appointments lasting 30 min.

Method

The study was designed by university researchers in concert with a Steering Group of senior managers and clinicians from the IAPT services involved. The aim was to explore the Type 2 translation gap using an implementation research approach (Peters *et al.* 2013). Specifically, we did not want to make any modifications to current service practices to accommodate the study that would not be a feasible permanent change. An important implication of this decision was to conceive of a web-based intervention as an additional offering that provided choice to service users rather than as a replacement of any existing service. A key component of the research then was to understand who would choose the web-based intervention and how service users would use it to help themselves.

Participants

Participants were initially identified as suitable to receive a low-intensity intervention for depression or low mood through triage of a patient's self-assessment form by team leaders, all of whom were qualified CBT therapists. Patients then had an initial assessment with a PWP who considered a person's suitability for MindBalance in reference to the patient's identified difficulties, goals and the studies inclusion and exclusion criteria (shown in Table 2). If the patient satisfied these criteria, they were given a choice between the MindBalance web-based intervention and the currently used paper manual for guided self-help.

The study aimed to include 30 participants from a population of 4500 individuals referred to three IAPT services in the East of England from February to July 2012. Of those, only 29 people, or 0.6%, were offered MindBalance. Seventeen individuals chose to use it and 12 actually used it.

Data collection

Three types of data are reported in this paper: outcome measures, log-data of application use, and interview data. The outcome measures included:

Beck Depression Inventory (BDI). The 21-item self-report instrument is intended to assess the existence of the severity of symptoms of depression according to DM-IV criteria. The Inventory is a 4-point scale ranging from 0 to 3. The BDI scores are analysed using the BDI score breakdown: 0–13 minimal depression, 14–19 mild depression, 20–28 moderate depression, 29–63 severe depression (Beck *et al.* 1961, 1988).

Patient Health Questionnaire (PHQ-9): The 9-item self-report instrument is used to consider symptoms and functional impairment from depression, make a tentative diagnosis, and derive a severity score to help select and monitor treatment. The scale ranges from 0 to 27 (0–4 no depression, 5–9 mild depression, 10–14 moderate depression, 15–19 moderately severe depression, 20–27 severe depression) (Gilbody *et al.* 2007). It is a measure stipulated by the Department of Health for all IAPT services.

Work and Social Adjustment Scale (WSAS): The 5-item scale measures general social impairment and is used in this pilot study to consider wellbeing in addition to level of depression (Mundt, 2002). The scale has a maximum score of 40 (0–9 sub-clinical, 10–19 significant impact, 20–40 severe impact). It is a stipulated measure by the Department of Health for all IAPT services.

The BDI measures were collected pre- and post-intervention through an electronic questionnaire. The PHQ-9 and WSAS data were collected before the start of the intervention as well as after every review as stipulated by the Department of Health through electronic questionnaires. The first and final measures collected were used for the data analysis. An automated email prompted participants to complete the measures 2 days before their scheduled review.

Log-data was collected for each participant, capturing the time-stamp and URL of each page or component used. All participants were invited to interview, including those who did not complete the intervention.

Data analysis

Numeric comparisons were used to capture who chose to use MindBalance. They focused on age, gender, ethnicity, and severity of condition as these measures are thought to affect service utilization (Parry *et al.* 2011). The data are reported but no comparative tests were carried out given the small sample size.

Clinical outcome data and mean changes for BDI, PHQ-9, and WSAS are reported as indicative measures of feasibility. Repeated-measures *t* tests are used as non-parametric tests

would be inappropriate given the universal improvement coupled with the small sample size. By the nature of the non-parametric analysis required, it would provide a significant result that may suggest more than can be conservatively concluded. In line with current approaches to measurement in IAPT, we also report levels of ‘caseness’. Caseness for PHQ-9 refers to a person reporting scores of ≥ 10 on the PHQ-9. A person is said to have moved to non-caseness if this score decreases to < 10 at the final session. Reliable change was analysed using the Reliable Change Index Calculator (Evans *et al.* 1998).

Usage was explored through the number of participants still using MindBalance at the last review. We define active usage as the viewing of a content page or using an app. Any usage includes reading a review posted by the supporter or using the journal function. This dual measure incorporates multiple possible approaches to the log-data outlined in the literature (Danaher & Seeley, 2009). We also present two contrasting vignettes of MindBalance usage taken from the log-data and interviews to highlight different approaches users took to the intervention. They are not intended to encapsulate general user views.

Results

Who chooses to use MindBalance?

MindBalance was offered in three IAPT services in the East of England from February to July 2012. Of the 4500 people referred for guided self-help, 29 people, or 0.6%, were triaged as appropriate to the study.

More than half of those offered MindBalance chose to try it ($n = 17/29$). Of those who declined, more than half ($n = 7/12$) wanted to be seen face-to-face as a preferred mode of interaction or for a perceived sense of motivation. The remainder did not want, or were unable, to use computers. A number of people initially chose to use MindBalance but did not use it past the first log-in or respond a follow-up letter about an alternative therapy ($n = 5/17$). The majority of these ($n = 4/5$) were recruited from the waiting list. These participants were withdrawn from the study according to the policy of IAPT services for those who do not attend.

Comparing those who accepted, declined, or completed MindBalance, our data do not show any discernible trends in terms of age, gender, PHQ-9, or ethnicity as shown in [Table 3](#).

Is MindBalance effective for these clients?

All outcome measures showed a decrease, indicating improved self-reported depression symptomatology and decreased social impairment as shown in [Table 4](#). Nine out of 12 completed the BDI at the start and end of the intervention. Eight out of nine reported a decrease in the BDI measure, with a mean decrease of 9.5 for the cohort. The pre-mean of 24 can be classified as moderate depression while the post-mean of 14.5 is classified as mild depression.

Similarly with the PHQ-9, 10/12 participants showed a decrease in their scores, with a mean drop of 6.5. Using IAPT’s measure ‘caseness’ for the PHQ-9, 10/12 met ‘caseness’ at the beginning of the intervention with 7/10 moving to ‘non-caseness,’ achieving reliable change.

Table 3. The age, gender, severity level (PHQ-9), and ethnicity of those who accepted, declined, and used MindBalance

	Declined (n = 12)	Accepted (n = 17)	Used (n = 12)
Age, years			
17–36	5	5	2
37–56	6	10	8
57–66	1	2	2
Gender			
Male (n = 11)	4	7	4
Female (n = 18)	8	10	8
Severity (PHQ-9)			
1–9 (low)	4	6	3
10–18 (medium)	7	8	5
19–27 (high)	1	3	4
Ethnicity			
White British	11	16	12
Other	2	1	0

PHQ-9, Patient Health Questionnaire.

Table 4. Statistics of the pre- and post-BDI, PHQ-9, and WSAS scores of those who used MindBalance

	Pre mean (S.D.)	Pre range	Post mean (S.D.)	Post range	Repeated-measures <i>t</i> test
BDI score					
Overall sample (n = 12)	27				
Sub-sample (n = 9)	24 (9.16)	7–35	14.5 (12.88)	0–38	$t_8 = -3.2, p = 0.01$
No post-BDI (n = 3)	36				
PHQ-9 score					
Participants (n = 12)	14.25 (5.14)	2–22	7.75 (6.7)	1–24	$t_{11} = -4.21, p = 0.001$
WSAS score					
Participants (n = 12)	18.68 (10.51)	9–33	10.17 (11.96)	0–35	$t_{11} = -3.05, p = 0.01$

BDI, Beck Depression Inventory; PHQ-9, Patient Health Questionnaire; WSAS, Work and Social Adjustment Scale.

Social impairment was measured by the WSAS with 9/12 reporting a decreased score, with a mean decline of 8.4. Of the nine patients who indicated substantial functional impairment, seven reported a decrease in their WSAS scores.

How do clients use MindBalance?

We first calculate adherence as the most common measure of usage. Mirroring how adherence is calculated in a face-to-face intervention, we define this as participant usage before each review produced by the PWP. Five out of 10 participants used MindBalance before all eight reviews, while 2/10 did so actively. We also calculated adherence as participation in the final review, reflecting the flexible nature of web-based interventions. When considered in this way,

Table 5. Volume of MindBalance usage. An adjusted sample is also reported that excludes the two heaviest users and is more representative of normal usage

	Mean	S.D.
Number of sessions	20.83	20.22
Number of sessions with adjusted sample	15	4.93
Number of active sessions	15.42	18.71
Number of active sessions with adjusted sample	9.33	3.31
Length of sessions	12 min 28 s	4 min 43 s
Length of sessions with adjusted sample	13 min 23 s	4 min 24 s

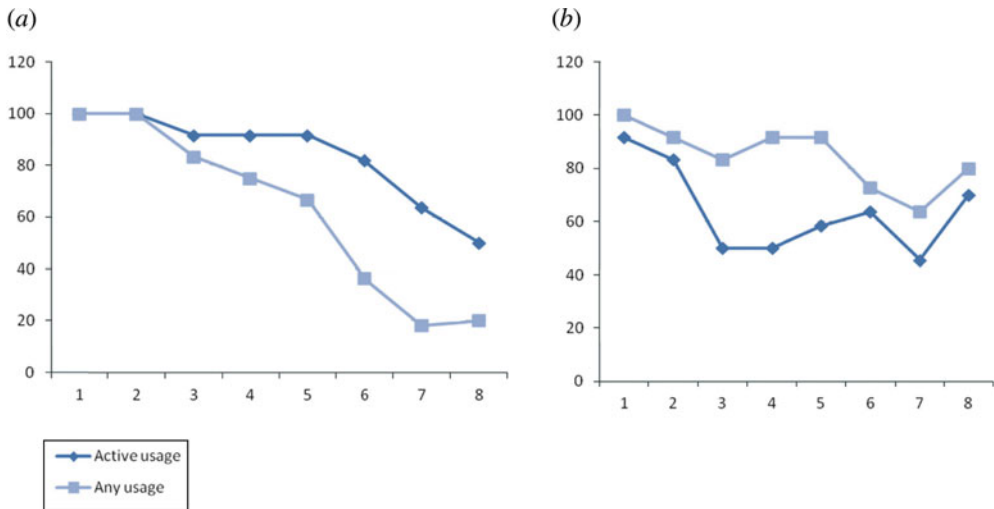


Fig. 2. Percentage of participants that: (a) used MindBalance before n number of reviews; (b) used MindBalance before the n th review.

the numbers look quite different. Eight out of 10 participants were using the intervention at the final review, 7/10 actively. These are visualized in Figure 2. Two out of 12 participants had interventions of fewer than eight sessions after agreeing with their PwPs that they felt well enough to be discharged early. While this fits with the flexible nature of web-based interventions, they could not be included in the visualizations.

As an alternative measure of usage, we looked at time spent using the intervention. This data shows that the nature of a 'session' in a web-based intervention is very different than a face-to-face or telephone session. Even if we class the two most active users as outliers, web-based sessions were greater in number than face-to-face sessions in the same service (any: 15 vs. 6; active 9.3 vs. 6), but half as long (13 min vs. 30 min). Interestingly, the outlying extreme users (58 sessions each) used the intervention more frequently, but not for longer periods of time in one sitting (see Table 5 for all data).

Data in Table 5 also show that there is high variation in session length. The mean standard deviation of session lengths is 17.5 min, longer than the average session length. The mean of participants' longest session is close to 1 hour. This data underscores what we found in the log-

data. Most participants spent some longer sessions focused on content, but had many shorter sessions practising skills through the apps, such as mindfulness. More than half of all sessions were devoted exclusively to app use. Session timing was also irregular. Some participants took breaks, while others used it at night or at weekends. It was clear that participants took advantage of the flexibility offered by the web-based intervention.

To further elucidate how people engage with web-based interventions, we captured patterns of use derived from the log-data and qualitative interviews. All participants were invited to interview and four of these accepted. Three of the four found the intervention useful and the fourth did not use it as she wanted to be seen face-to-face. It is unfortunate that we were unable to recruit those who ceased using the intervention, but this is not surprising given the sensitive nature of mental health. For illustrative purposes, we compare the patterns of use of two participants, Janet and Robert, who both gained benefit from MindBalance but achieved it differently. The data is captured in more detail in [Table 6](#) and summarized in the following paragraphs.

Both Janet and Robert experimented with different features in the first 2 weeks before quickly falling into distinctive patterns of use. Janet focused on moving through, and reviewing content in a regular manner, and repeatedly using a single app. Robert focused on apps, particularly the mindfulness ones, reviewing content on an *ad hoc* basis or when pointed to it by his supporter. Each of these patterns matched the motivation of use – for Janet, a step-by-step approach to help her get better and for Robert, a sanctuary to calm the mind. Engagement came in this case from the creation of a personalized path through the intervention that matched the participant's motivation of use. These patterns of use are graphically depicted in [Figure 3](#).

Human support played an important, but different, role for each person. Janet was confident in navigating the content of MindBalance, but desired a bit more moral support that she may have received if seen face-to-face. She would have liked to use this intervention in combination with face-to-face sessions. By contrast, Robert did not want to be seen face-to-face, preferring to focus on MindBalance as a way in which he could help himself. Nonetheless, he visited his shared support page nearly every session and relied heavily on the guidance provided to view particular parts of the intervention. Interestingly, Robert started using parts of MindBalance with this wife; first the print-outs and then joint working in order to help her understand how to help him. Janet, on the other hand, chose not to share anything that she did in MindBalance with her family and felt disturbed if they entered the room when she was using it.

Discussion

We have presented an implementation pilot of the web-based intervention for depression and low mood, MindBalance, in a realistic primary-care mental health setting, three IAPT services. The aim of the study was to raise issues that might contribute to a persisting Type 2 translation gap with web-based interventions, keeping a treatment effective in clinical trials from widespread use in clinical practice. We discuss the results of the study in terms of three key concepts encapsulated in the research questions: patient acceptability, clinical effectiveness, and usage patterns. We then reflect in more depth on the most surprising result of the study, that very few people were offered MindBalance, raising substantial unexpected implementation issues.

Table 6. *Patterns of use of two contrasting participants, Janet and Robert*

Janet	Robert
Person description	
<p>Janet is in her mid-forties and lives with her husband and primary-school-aged child. She suffered from severe depression and had been off sick from work for several weeks when she started MindBalance. She describes herself as someone who ‘likes doing things in a certain way’, referring to the organized and structured way in which she proceeded with MindBalance. She had previously read about CBT and mentioned several times that she understood that nobody was going to give her any answers.</p>	<p>Robert is a gentle man in his late forties who lives with his partner. He suffered worsening depression following a break with his business partner and an ensuing court case. Robert was referred to the mental health services when his doctor realized that an unusually difficult situation would likely impact his mental health. He finds it difficult to sleep and to concentrate now.</p>
Attitude towards web-based intervention	
<p>She found MindBalance ‘beneficial,’ but would not have chosen it had she been offered face-to-face therapy rather than been placed on a waiting list. Having experienced it, she would have liked to have had it alongside face-to-face therapy.</p>	<p>Robert was somewhat sceptical when he started using MindBalance, because he did not think he needed mental health assistance. In retrospect, he was grateful for it. He particularly liked the self-help model, because he did not think a mental health problem was more than a personal problem that a person should cope with. He felt better that he could help himself. He would choose MindBalance over face-to-face.</p>
Recovery	
<p>Janet reached recovery by the end of treatment by all measures taken: BDI: 33→10, PHQ-9: 18→3, WSAS: 34→0.</p>	<p>Robert did not have substantial improvements in his outcomes for depression (BDI: 35→38; PHQ-9: 22→18), but did have improvements in quality of life measures (WSAS: 27→15). His supporter was not surprised by this as his escalating work situation was indeed difficult to cope with.</p> <p>Robert himself was concerned that the value that he had derived from MindBalance was not appropriately measured and gave the following feedback:</p> <p>‘Just a small point and that is I am a little concerned that if the benefits of SilverCloud were being judged only on the questionnaires [PHQ-9] that I have been completing and someone could underestimate the usefulness of the programme. I know that if I had either been given access to the programme too late or not at all I would be in a very difficult situation right now. The programme has in my opinion been of huge benefit to both [my partner] (indirectly) and obviously me.’</p>

Table 6. (cont.)

Janet	Robert
Usage scenario	
<p>Janet used MindBalance on the computer in her study which she considered a private place. In the beginning she did it during the day while off work, but towards the end she had to fit it around work in the evenings. She could not use it if interrupted by one of her family members. Several times she texted in from work as she felt it was important to record things when she felt particularly bad. However, her job did not allow her to engage much when working.</p>	<p>Robert used MindBalance on his laptop and would take it to a comfortable, private spot. He mentioned using it in his conservatory or in his bed, late at night. He used it when no one was around, such as when his partner was out. He thought of MindBalance as his ‘sanctuary’ and needed it more when he was alone.</p> <p>He did not use MindBalance on his iPhone, but thinks he might have done had he had the phone when he started MindBalance. He mentioned that there were a number of times that he was on a train and would have liked to get his thoughts down.</p>
Usage	
<p>Janet used MindBalance 59 times over 72 days, some days with multiple sessions. She stated that she used it regularly, but less towards the end of the treatment period. Her sessions lasted between 1 min and 2:05 hours. About half of her sessions were shorter than 10 min (27/59), and 9/59 were over 40 min. Longer sessions were more frequent at the beginning of the treatment period. Janet did most of her sessions between 9 am and 6 pm with no particular pattern over starting hour or day of week.</p> <p>She noted in the interview that she did need purposefully to put time aside to do it, especially upon returning to work. She stopped her MindBalance session when she felt tired or ‘couldn’t take anymore’. She was aware that she used MindBalance less as she started to feel better.</p>	<p>Robert used SilverCloud 58 times over 82 days, having multiple sessions on some days. Sessions lasted between 1 min and 1:24 hours with two-thirds of the sessions being less than 10 min (38/58), and just 4/58 being over 40 min. About half of his sessions (29/58) took place at night after 10 pm with no particular pattern over days of the week.</p> <p>Robert used MindBalance regularly, initiating use when he wanted to put his thoughts together, either by writing in the journal or using the mindfulness audio-recordings. He often used this late at night when no one was home as his ‘sanctuary.’ He stopped using it when he could not concentrate any more.</p>

Table 6. (cont.)

Janet	Robert
Content approach	
<p>Janet was consistent in tackling the modules in order. In each one, she covered all the material in the order presented. She attempted all modules several times, often reviewing several in one sitting, particularly the first three. In most of her sessions, she completed more than one module, finishing one and getting partway through another.</p> <p>Janet described her use of MindBalance as starting at the beginning and doing all of the exercises presented along the way. She tried all of the interactive content, and particularly liking the videos of people’s stories.</p> <p>In general she preferred to focus on reading. She quickly settled into using just the journal, the <i>Thoughts Feelings Beliefs</i> app, and the mood monitor.</p> <p>Many of Janet’s sessions began with an entry into her journal or reading the review page shared with her supporter. Some of these journal entries were followed by the use of an app or two, while others turned into content sessions. Shorter sessions focused on app use and longer ones on content.</p>	<p>Robert was inconsistent in tackling the modules. He jumped from section to section with a general trend of starting at the beginning and working his way to the end. He did not progress through all of the content, but focused on content introduction and main content points and the apps. He never looked at personal stories and completed the module review only twice.</p> <p>Robert described his usage of MindBalance as ‘clicking about a lot’, always finding something he could relate to. He particularly liked the activity scheduling and the sections on ruminating. He came across most things eventually and his supporter spent a good deal of effort pointing him to particular parts of MindBalance. His supporter felt that this lack of order related to Robert’s inability to concentrate. Robert himself claims that he was not aware that there was any order, but would have followed it had he been.</p> <p>Robert’s pattern of use focused around journal usage and apps rather than content. Nearly two-thirds of his sessions (34/58) had no content viewing at all and many content sessions were dominated by app use.</p>

Table 6. (cont.)

Janet	Robert
<p>Janet shared everything with her supporter and could not think of anything she would not have shared. She hoped that her supporter ‘would get to know me’. In sharing, Janet could ‘get things off her chest’ that she felt unable to cope with on her own. According to the log-data, she left a note for her supporter before each scheduled review and viewed the supporter’s comments on the shared page during 16 of her 59 sessions. On one occasion she viewed previous comments from her supporter. She also actively shared 32 items beyond those shared by default with her supporter.</p> <p>Janet seemed both pleased and nonplussed by the support. She felt she had poured hours of time in, but was not getting that much response. That said, she noted that having a supporter was an important aspect of MindBalance and the supporter always acknowledged her work and made comments. It seems that she may have been experiencing a conflict between her knowledge that CBT does not provide moral support and a desire to have that support.</p> <p>She did not discuss seeking support or share any of her activities with her family.</p>	<p style="text-align: center;">Support</p> <p>Robert made a conscious decision to share everything with his supporter. He always referred to his supporter by name and could not praise him enough for all of his insights and encouragement. He was glad that he had the choice to share, because he thought that if he had received negative feedback about something, he would stop sharing that bit.</p> <p>He did not have many expectations for his supporter, but was pleased with what he got. He felt that the presence of the supporter was crucial. Not only did it give him direction, but it gave him (and his wife) peace of mind that if something got out of control then someone would notice. He shared 25 items with his supporter and left a note before each session. He checked the page shared with his supporter during 50 of his 58 sessions. In addition to sharing with his supporter, he talked about his preference to share his thoughts with a computer through the diary function. He described the computer as non-judgmental. It seems that the online medium may have been a particularly appropriate for him given his desire for privacy.</p> <p>He shared MindBalance with his wife towards the end of the treatment period. He first printed out the activity schedule so that she could encourage him to stick to his goals. Later, they worked together to check the weekly scores. Robert felt that this would help his wife understand what he was going through and decrease her worry about his mental state. He proposed that, in future, partners might have access to SilverCloud to view their partner’s progress.</p> <p>Robert continued to use SilverCloud without a supporter for the 4 months that it was available to him, signing in an additional 15 times.</p>

BDI, Beck Depression Inventory; PHQ-9, Patient Health Questionnaire; WSAS, Work and Social Adjustment Scale.

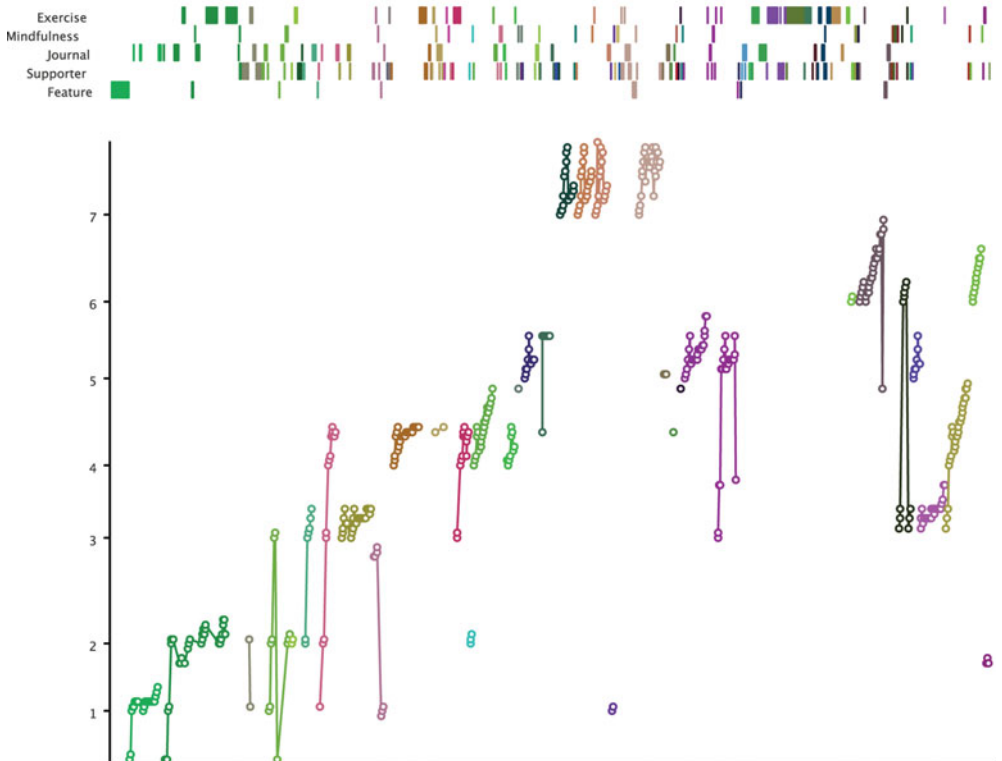
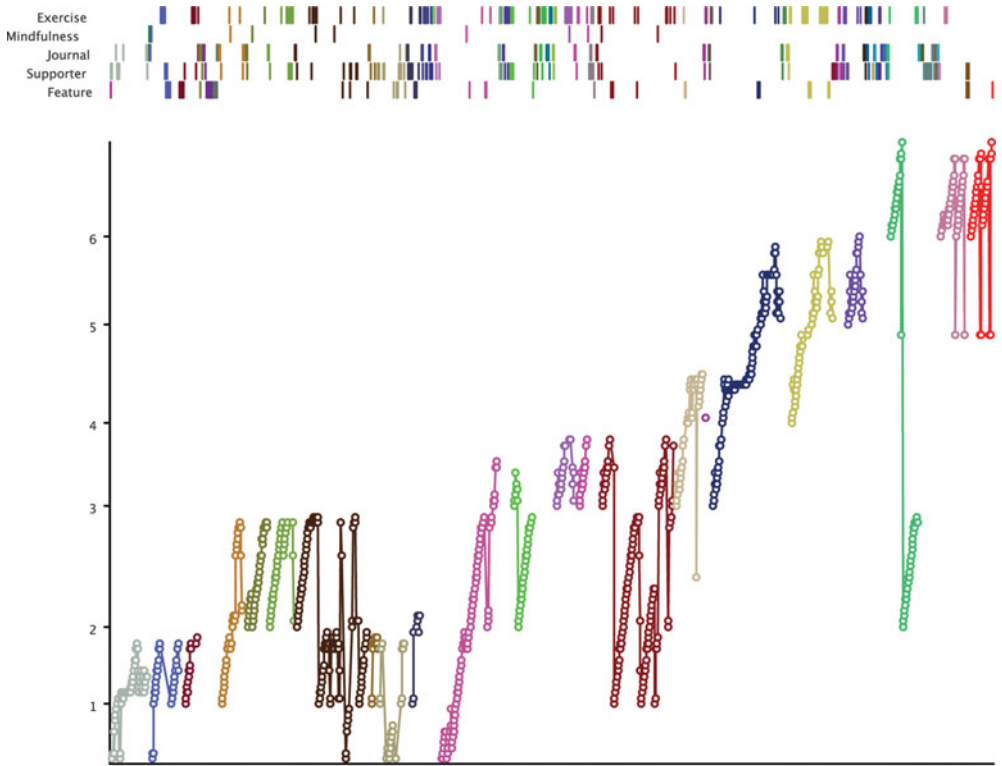


Fig. 3. MindBalance module usage for case studies: (a) Janet; (b) Robert.

Patient acceptability

Patient acceptance of web-based interventions has been raised as a potential barrier to implementation (Waller & Gilbody, 2009), prompting us to consider who chose to use MindBalance in our pilot. Of those offered MindBalance, 59% chose to use it. This is higher than the 3–25% rates in a systematic review of patient acceptability of web-based interventions for depression and anxiety (Kaltenthaler *et al.* 2008b), although these numbers may also differ due to different measures of acceptability. It is also higher than the results of a survey of those seeking behavioural treatments in which 48% would agree to use of a web-based intervention, with desires lowest for those seeking mental health treatment (Mohr *et al.* 2010). Our data are in line with findings of several systematic reviews that those who use a web-based intervention are positive about the experience (Christensen *et al.* 2006; Kaltenthaler *et al.* 2008a).

Studies of patient acceptability have not previously differentiated between potentially different groups of participants (e.g. men *vs.* women). The study Steering Group hypothesized that those who are either younger or male would be more likely to choose a web-based intervention over face-to-face treatment. Younger people are comfortable with the style of technology and men indicate greater confidence with technology and may want to receive help more anonymously. Our data did not indicate any differences between patient groups. If anything, those who withdrew were younger and male. This question needs to be examined again in a study with a larger number of participants, but our data indicates that differences may not be as prevalent as we suspected.

Interviews conducted with the PWP who offered MindBalance to participants suggested that the manner of offer may sway a participant's willingness to try a web-based intervention. One PWP, who had very few refusals, took a very positive approach in describing MindBalance, emphasizing how the benefits matched the desires of the participant. For example, the PWP described MindBalance as guided self-help that was conveniently accessed through the internet rather than describing it as a web-based intervention. At the beginning of the pilot, we did not fully appreciate the attention needed to refine the language of presentation. We recommend that services put substantial effort into convincing those offering a web-based intervention of its benefits, ensuring they understand how clients might benefit. A series of scripted statements might further encourage uptake.

Clinical effectiveness

The results of this study indicate that MindBalance is likely to be clinically effective, with outcomes commensurate with larger studies (Proudfoot *et al.* 2004) and MindBalance usage in other settings (Sharry *et al.* 2013). This finding is not surprising and is in line with the clinical effectiveness of web-based interventions for depression (e.g. Spek *et al.* 2007). However, the data should be treated cautiously given the low number of participants.

Usage patterns

Engagement with MindBalance was high, with 70% of participants actively using it at their last review. This exceeds the 50% level common to many studies as discussed in a large meta-review (Christensen *et al.* 2009). The qualitative data suggested that support played a

crucial role in engagement, a clearly emerging theme in web-based interventions (Andersson, 2010). Looking more deeply, engagement looked very different from face-to-face treatment. Participants' usage was more frequent but for shorter periods of time than face-to-face treatment. There was a substantial focus across participants on using tools, such as the Mindfulness apps, and not just reading the content of the intervention.

Most interesting was the variation in usage across participants as highlighted by the contrasting case-studies and the extreme users removed from the analysis of session numbers. Time of usage (day *vs.* night), purpose of usage (information *vs.* sanctuary), and activities completed (content engagement *vs.* app usage), as well as amount of usage, differed markedly. As personalized and stratified medicine become more pronounced strategies in health services, this variation should be further explored and exploited to understand who best benefits from web-based interventions and whether this can be predicted during early usage (Ruggeri *et al.* 2013).

We might conclude that web-based interventions are not cheaper replacements for therapists conducting manualized guided self-help, but rather a different, and potentially more flexible way, for participants to engage with CBT concepts.

Implementation issues

The data collected on patient acceptance, usage, and clinical effectiveness suggest that for those who used MindBalance it met the necessary criteria. However, finding eligible participants was a substantial problem. Of the 4500 referrals for guided self-help in the pilot period, only 29 people were approached, even though about 30% (1350) would have been expected to receive an intervention for low mood or depression. We drew on the reflections of the clinical team members involved from a post-pilot focus group to understand the implementation issues that occurred.

The low number of offers stemmed in part from perception that very few people were suitable for the study. One explanation provided was that very few people would receive only support for depression. Twenty-nine percent of the referrals to IAPT are recorded as being treated for both depression and anxiety, although this number is thought to be higher in practice as therapists draw on appropriate material from both manuals. This highlights that, while most interventions are designed for and tested with a single population, in practice they need to accommodate more than one condition to be practical when used by services.

We also suspect that finding participants may have been affected by therapists' perceptions of MindBalance. Those involved with the pilot commented that other PWPs did not refer to MindBalance on a regular basis because they viewed the intervention as too restrictive. While MindBalance covered the core CBT interventions for depression that would be used in the manuals, it allows for less discretion on part of the PWP to incorporate additional material. The desire to mix and match may be particularly relevant to the IAPT cohort which has a substantial number of clients who have elements of both depression and anxiety. However, it is not clear whether this is a problem of the intervention or represents 'therapist drift' (Waller, 2009). Greater therapist familiarity with, and belief in, MindBalance by therapists outside the pilot may have increased the number of times clients were referred.

The process of identifying participants may have contributed to the low numbers who met eligibility criteria. One service screened participants with a questionnaire that required agreement to contact by email and provision of an email address before becoming eligible for

the pilot. It is very likely that many clients ticked 'No' to this question for reasons other than not wanting to use a web-based intervention.

Discussion also suggested that high levels of presenting complexity and suicide risk dissuaded therapists from referring to the web-based intervention. While there were measures in place to detect suicide risk, a web-based intervention decreases the therapist's ability to manage complexity and keep an eye on developing risk. Understanding that some populations, even in primary care, may need greater support than a web-based intervention is intended to offer encourages thought about alternative usage. The Steering Group discussed two other ways they might implement a web-based intervention in future: as an adjunct to face-to-face therapy, or through client initiation via a website. These approaches could address resource constraints for those who want or need face-to-face sessions and make self-help available to those who do not want to be seen face-to-face.

Summary

We have presented an implementation pilot of the web-based intervention for depression, MindBalance, in a realistic primary-care mental health setting, three IAPT services. The aim of the study was to raise issues that might contribute to a persisting Type 2 translation gap with web-based interventions, keeping a treatment effective in clinical trials from widespread use in clinical practice. The implementation issues that arose suggest that to achieve the promise of the internet to increase the reach of treatment and decrease the cost, substantial thought is needed to plan the integration of web-based interventions into existing services.

- *Web-based interventions for depression are acceptable to patients and clinically effective.* MindBalance is also likely to be clinically effective but further validation is needed with a larger trial.
- *MindBalance was used in highly individualized ways.* The data indicated that a web-based intervention may provide benefit to patients beyond the commonly assumed benefits of reduced waiting times and service cost reduction.
- *All therapists who are offering, or referring to, a web-based intervention should be very familiar with how it works and confident in its outcomes.* Reflections on the problem of finding participants in this study raised salient issues about the important role therapists play in making an intervention a success.
- *The language used to present a web-based intervention should be refined to encourage uptake.* Reflection on the success of some PWPs to encourage uptake suggests the importance of how the intervention is described and related to the participant.
- *Services may want to consider models of integration of a web-based intervention other than stand-alone use.* Web-based intervention may be best used in existing services as support for face-to-face sessions or as an access point without referral, rather than as a replacement for an existing offering.

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Declaration of Interest

None.

Follow-up reading

e-hub (<http://www.ehub.anu.edu.au/>). e-hub is an initiative of the ANU Centre for Mental Health Research. e-hub develops and evaluates websites that deliver psycho-education and psychological interventions for common mental health problems, as well as clinical and consumer networking.

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Learning objectives

- (1) Gain a broader knowledge of web-based interventions mental health and depression specifically.
- (2) Become familiar with SilverCloud, a new platform that supports the rapid development of online interventions for common mental health problems, that addresses client engagement.
- (3) Understand key issues of implementing a web-based intervention into an existing primary care mental health service.