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Development of an online intervention for bipolar disorder. www.moodswings.net.au

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We describe the development process and completed structure, of a self-help online intervention for bipolar disorder, known as MoodSwings (www.moodswings.net.au). The MoodSwings program was adapted as an Internet intervention from an efficacious and validated face-to-face, group-based psychosocial intervention. The adaptation was created by a psychologist, who had previously been involved with the validation of the face-to-face program, in collaboration with website designers. The project was conducted under the supervision of a team of clinician researchers. The website is available at no cost to registered participants. Self-help modules are accessed sequentially. Other features include a mood diary and a moderated discussion board. There has been an average of 1,475,135 hits on the site annually (2008 and 2009), with some 7400 unique visitors each year. A randomised controlled trial based on this program has been completed. Many people with bipolar disorder are accepting of the Internet as a source of treatment and, once engaged, show acceptable retention rates. The Internet appears to be a viable means of delivering psychosocial self-help strategies.

Keywords: bipolar disorder; Internet; self-guided

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Background

Bipolar affective disorder is a common chronic disabling condition, with a population prevalence rate estimated between 1% and 4% (Kessler et al., 2005). Direct service costs for bipolar disorder in the coming decade were estimated at AU$400 million per annum, with more indirect costs consequent upon losses in productivity, carer burden and welfare benefits increasing this figure by a factor of four (Access Economics and SANE Australia, 2003).

Medication is the primary treatment approach and can significantly improve outcomes (Malhi et al., 2009). Issues of non-adherence, high rates of relapse even when treatment adherent and a reduction of functionality between episodes are challenges to the treatment and management of this disorder (Gitlin, Swendsen, Heller, & Hammen, 1995; Keck, McElroy, Strakowski, Bourne, & West, 1997). Ongoing difficulties outside of an acute episode have also been noted, with evidence of impairment across multiple psychosocial domains (Hammen & Cohen, 2004). A review by MacQueen, Young, and Joffe (2001) noted that studies of psychosocial outcomes consistently found that 30–60% of people with bipolar disorder experienced compromised psychosocial functioning. These issues of functionality, adherence and the medication effectiveness–efficacy gap have established a role for adjunctive psychosocial interventions (Berk et al., 2010; Lauder, Berk, Castle, Dodd, & Berk, 2010).

There is strong emerging evidence that psychosocial interventions can enhance medication adherence in bipolar disorder (Colom, Vieta, Martinez-Aran et al., 2003). Meta-analyses and systematic reviews indicate that adjunctive psychosocial interventions also have the ability to both prevent and delay relapse (Castle et al., 2010; Lam, Burbeck, Wright, & Pilling, 2009; Vieta et al., 2009). The efficacy in terms of relapse goes beyond medication adherence (Colom, Vieta, Reinares et al., 2003) and may, inter alia, be accounted for by fostering a greater personal understanding of the disorder, identification of prodromes and the development of healthy coping strategies (Beynon, Soares-Weiser, Woolacott, Duffy, & Geddes, 2008; Colom, Vieta, Reinares et al., 2003). The ability of psychosocial interventions to be effective in both poles of the illness has been demonstrated by a number of studies (Castle et al., 2010; Colom et al., 2009). Miklowitz (2008) recent review of adjunctive psychotherapy also noted a number of positive functional outcomes in terms of social, occupational and quality of life domains. A range of psychological approaches have been evaluated using randomised controlled trial (RCT) designs, including cognitive behavioural therapy (CBT; Lam, Hayward, Watkins, Wright, & Sham, 2005; Scott et al., 2006), psychoeducation (Colom et al., 2009), family-focused therapy (Miklowitz et al., 2000), social rhythm therapy (Frank et al., 2005, 1999), caregiver interventions (Perlick et al., 2010; Reinares et al., 2008) and interventions that include multiple elements (Castle et al., 2010).

Although psychosocial interventions can provide treatment benefits, access to these specialist interventions are limited, due to supply and access constraints. This is particularly so outside of capital cities, where rural and regional centres are under-serviced by health professionals (Bamford et al., 1999). In Australia, for example, 91% of psychiatrists' main practices are based in metropolitan areas, with a similar pattern for psychologists (Judd & Humphreys, 2001). Wang et al.'s (2005) study of the use of mental health services in the United States noted that those living in rural areas and those on low incomes were among those not receiving adequate treatment.

The use and acceptability of the Internet as a medium for information on a range of physical and mental health issues is well documented (Fox et al., 2000). Those with stigmatised illness have also been found to use the Internet significantly more for health information than those with non-stigmatised illness (Berger, Wagner, & Baker, 2005). Increasingly over the past decade, the Internet has also been the vehicle for psychosocial interventions (Barak, Hen, Boniel-Nissim, & Shapira, 2008; Lauder, Chester, & Berk, 2007). Online programs can provide access to specialist programs either where they may not exist, such as in rural or remote areas (Ybarra & Eaton, 2005) or where demand exceeds supply (Titov, 2007). Online programs are able to transcend the barrier of stigma, as individuals are free to seek information in relative privacy (Abbott, Klein, & Ciechomski, 2008).

A number of Internet-based psychosocial interventions have been developed and validated in the mental health area (Barak et al., 2008).These include interventions for unipolar depression (Andersson et al., 2005; Mackinnon, Griffiths, & Christensen, 2008), panic disorder (Klein, Richards, & Austin, 2006), phobias (Schneider, Mataix-Cols, Marks, & Bachofen, 2005), post-traumatic stress disorder (Klein et al., 2010) and eating disorders (Winzelberg et al., 1998). The take-up of such programs is impressive; for example, the publicly accessible MoodGYM depression program recorded 17,646 sessions (an indication of visitor numbers) over a 17-month period (Christensen & Griffiths, 2002). Overall, results of such studies support their effectiveness and highlight their potential in enhancing mental health outcomes (National Institute of Clinical Studies, 2003).

Preliminary research suggests that e-therapy is less expensive than face-to-face, with similar effect sizes (Klein et al., 2009, 2010; Mihalopoulos et al., 2005). Current online programs differ in level of support and use of interactive tools. Greater effect sizes have previously been found in interactive programs, which are typically CBT-based, in comparison with static sites that tend to use simply a psychoeducation model (Barak et al., 2008). Interventions also vary from being completely self-guided to having some level of therapist support. Although therapist-assisted models have generally been associated with greater effect sizes than self-help models, the meta-analytic research conducted in this area (Barak et al., 2008; Spek et al., 2007) has been plagued by methodological limitations such as the use of waitlist controls confounding any definitive conclusions.

We are aware of four other online interventions for bipolar disorder. A psychoeducation-only program (Proudfoot et al., 2007) created interest, with 8000 visitors in its first six months, including people with bipolar disorder, service providers and caregivers. This program is currently being evaluated via an RCT comparing psychoeducation alone with consumers as online ''informed supporters'' for those newly diagnosed with bipolar disorder (Proudfoot et al., 2009). Barnes, Harvey, Mitchell, Smith, and Wilhelm (2007) have evaluated a self-help 21 session program containing elements of psychoeducation and CBT and comparing it with an attention control group directed to public websites that focus on healthy living. No significant differences in time to relapse were found between the intervention and control groups (Barnes et al., 2007). More recently, a psychoeducation program developed in the UK is combining both online and face-to-face delivery. The ''beating bipolar'' intervention combines an initial face-to-face session with eight fortnightly online modules and a clinician-moderated discussion board. The intervention is being compared with treatment as usual in an RCT (Simpson

et al., 2009). Preliminary results of this study failed to separate on the primary outcome measure (Smith et al., 2011).

The fourth bipolar intervention, and the focus of this paper, is known as MoodSwings www.moodswings.net.au. MoodSwings is alone as an online adaptation of a face-to-face program, in this case the MAPS program (Castle et al., 2010). It utilises the content of effective face-to-face group sessions as the core program modules and follows a similar approach to the post-program booster sessions.

The aims of this paper are to describe the process by which the MoodSwings website was developed from an efficacious face-to-face program and to describe the content of the website and key features of the online program.

Method

The MoodSwings website was constructed by adapting a validated face-to-face group-based psychosocial intervention, the MAPS program for bipolar disorder (Castle et al., 2010) as an Internet-based intervention. The original face-to-face intervention administered 12 weekly sessions and 3 follow-up monthly booster sessions. The multidimensional program included key components of other validated modalities, psychoeducation and CBT, as well as elements of dialectical behavioural therapy, social rhythm therapy and motivational interviewing. The MoodSwings website was constructed by the current authors. These included some of the key people who designed and validated the original face-to-face program. The team also included members with expertise in bipolar disorder, as well as previous experience and expertise in the development of online interventions (e.g. Klein et al., 2006). The team members regularly communicated through emails and regular telephone and group meetings. Website content was drafted by one of the authors (SL) and agreed and finalised by consensus. The SDH consulting (Melbourne, Australia) was engaged on a fee for service basis, as experts in web design and online technologies. Funding was provided by *beyondblue: The national depression initiative*. This is a non-profit organisation supported by Australian Federal and State Governments as well as community donations. Draft versions of the MoodSwings web pages were circulated among team members in an iterative manner until the team agreed that it was ready for the site to go live.

Results

MoodSwings program

An outline of the MoodSwings program is shown in Table 1. For pragmatic reasons, it contains fewer modules than the face-to-face intervention, but covers the same content areas. The core modules denote the active therapeutic content. Participants are given access to only those modules that are applicable to their type of bipolar disorder. Following the recommendation of Andersson et al. (2005), core modules become available every two weeks, giving participants time to review all the material in one module before moving on to the next. Previous modules can be accessed for the duration of the program.

The self-assessment measures provide a hurdle task for entry into the modules (see Table 2). The booster modules were designed as ''information only'' to correspond with follow-up outcome measures, at 3, 6 and 12 months. Module content was entered into the program via a content management system interface

Table 1. Summary of MoodSwings program.

	Module	Content summary
Core modules	1. What is bipolar disorder?	Reviews symptoms and criteria for diagnosis
	2. Stress and triggers of illness	Outlines common stresses and triggers and use of strategies such as mood monitoring and stress reduction
	3. Medication and the biological basis of bipolar	Biological basis for bipolar disorder and role of medication
	4. Depression	Symptoms, early detection and helpful strategies including a depression prevention relapse plan and suicide prevention plan
	5. Mania	Symptoms, early detection and helpful strategies including a preventing mania relapse plan
	Hypomania	Symptoms, early detection and helpful strategies including a preventing hypomania relapse plan
Booster modules	1. Review	A general review of strategies in the program
	2. Lifestyle issues	Lifestyle issues
	3. Communication	Communication skills and issues

Table 2. Self-assessments.

	Screening	Baseline	3	6	12
Clinical assessment (telephone)	×				
Self-report assessment		×			
Demographics					
Relapse					
Symptom severity					
Montgomery Asberg Depression Rating Scale – Self-assessment		×	×	×	×
Altman Self-Rating Mania Scale		×	×	×	×
Global measure of severity of depression		×	×	×	×
Global measure of severity of mania/hypomania		×	×	×	×
Psychosocial functioning					
Global measure of psychosocial functioning depression		×	×	×	×
Locus of control		×	×	×	×
Global measure of psychosocial functioning mania/hypomania		×	×	×	×
Quality of life					
Global measure quality of life		×	×	×	×
Medical Outcomes Study Social Support Survey Instrument		×	×	×	×
Medication adherence					
Medication Adherence Rating Scale		×	×	×	×
Qualitative questions*			×	×	×

Note: *Qualitative questions included covered changes of medication, relapse of illness and feedback about the program.

that allows the manipulation of text, HTML, images and FLASH and fine-grained control of content permissions.

Interactive tools

The basic content of MoodSwings employs a psychoeducational approach along with a limited skills component. In addition, the active intervention group receives CBT-based interactive elements. These include:

- *Mood monitoring*, including monitoring of depression, elevated mood, anxiety and irritability. Journal entries help link triggers and stressors with changes in mood and are visible on the mood monitor as scroll-overs on any of the data points. The mood monitor also allows for recording of number of hours slept, and whether medication has been taken as prescribed. Mood, irritability and anxiety ratings are also represented graphically.
- The *medication monitor* records current medication, along with the identification of perceived benefits and side effects.
- *A life chart* tool helps develop an understanding of the course of the participant's mood cycle and identifies past triggers of illness.
- *Cognitive strategies* are used to develop helpful thinking in both poles of the illness via monitoring and challenging unhelpful thoughts (Lam et al., 2003). These specific tools facilitate awareness of the cognitive changes that occur when becoming unwell. Strategies include thought monitoring and challenging and replacing unhelpful thinking patterns.
- *Motivational interviewing techniques* are used in weighing up goal directed activities (Miller & Rollnick, 2002). These are operationalised by evaluating strategies within a cost–benefit framework. This also links to problem solving and goal setting strategies where applicable. The tool directs participants to reflect on their current strategies in managing stresses and mood changes. Participants are able to enter their own personal responses.
- *A self-reflection tool* affirms elements of self to differentiate "self" from "illness". Participants identify pleasant activities that can be included in their depression relapse plan.
- *Problem solving and the setting of small goals* is used as a strategy to reduce stress, set realistic targets and overcome difficulties and barriers.
- Participants are able to record their *personal triggers* of illness and illness profile – including early warning signs and symptoms typically experienced during an episode of illness.
- Participants can develop their personalised "*preventing relapse plan*" that builds on material in the program and can readily be edited by the participant.

The psychosocial tools operationalise the program material and enable participants personally to apply the strategies utilising the online tools. At its most simplistic level, these are the forms that involve check boxes and selection of suggested options that provide the application of the content material in a personalised way. More sophisticated tools provide instant feedback, such as the mood monitor via its graphic capabilities. All of these tools have the potential to enhance engagement (Barak, Klein, & Proudfoot, 2009) and improve program outcomes. All pages can be printed by the participant and shared with their healthcare service provider.

Participants are encouraged to engage in the interactive elements of the modules to whatever level they are comfortable. Participation is encouraged though reminder emails if a module has not been commenced. The website tracks every individual page view (along with details of which user is viewing the page and their progress in the website), allowing the researcher to analyse usage patterns. All research data can be exported from the website in CSV format, which can be easily imported into SPSS.

Moderated discussion board

The MoodSwings program includes a moderated asynchronous discussion board for participants to communicate and share experiences via small groups with others enrolled in the program. The posts are moderated in that they are reviewed by a researcher prior to being posted to ensure that no distressing or inappropriate material is posted onto the board, but there is no active moderator presence on the board.

Beta testing of MoodSwings

MoodSwings was tested in a small beta-testing study to assess both the functionality and content of the program. Seventeen participants including healthcare service providers, postgraduate psychology students and a consumer consultant reviewed the site. The postgraduate students were used as a mock group and proceeded through the program in a similar, but accelerated manner to real participants. Issues identified were primarily around site navigation and with the usability of the questionnaires. In particular, a lack of automated direction to missed questions and the automated email reminders were the most problematic.

A small pilot group ($n = 12$) tested the intervention, in a clinical sample. Participants were recruited by referrals from service providers, and also through online sources such as general searches and links to the MoodSwings site. The majority of the pilot sample was female (83.3%) and had a diagnosis of bipolar 1 (75%). The mean age of the pilot was 41.92 (SD = 11.16). Of the 12 participants, 2 never logged onto the site. The remaining participants spent an average of three hours on the program (range 20–180 minutes). A number of technical issues related to usability were found to impact use of the program. Qualitative feedback from participants included support for the flash object used to illustrate key points, the usefulness of the online mood monitor and having the educational information presented in a sequential manner. This allowed the program to be refined and debugged in an iterative manner.

Discussion

Online interventions have been found to be effective in a range of clinical disorders. A number of new and innovative online programs as adjunctive treatments in bipolar disorder are now emerging. Our experience to date with MoodSwings suggests a high demand for such services: The fact that a high proportion of users live in rural areas suggests the paucity of face-to-face services for specialist psychosocial interventions in many such jurisdictions and affirms that online programs such as MoodSwings can go some way towards bridging this gap.

The feedback from the pilot group has supported the type of program we have developed, with a clear stepwise ''journey'', staged knowledge and skills acquisition, regular assessments and feedback and the online discussion board which seems to engage people as a virtual group; and in part the nature of bipolar disorder itself, with an often unmet need for the sort of information on offer. A future challenge will be to ascertain precisely which elements enhance retention, and to build on these.

Conclusion

MoodSwings is an online adaptation of the MAPS program, a validated effective face-to-face intervention for bipolar disorder (Castle et al., 2010). The process of establishing and evaluating the face-to-face program allowed us to refine the content, build the effective learning and skills acquisition tools and determine the overall content and structure of the online version. The site has demonstrated an encouraging degree of acceptance and may have advantages over traditional face-to-face therapies due to low costs, high reach and accessibility, impervious to time and distance and anonymity.

We are currently undertaking a formal evaluation of the outcomes associated with the use of MoodSwings: These findings will be reported elsewhere. At this stage, we believe that we have established a program that meets an unmet treatment need and which has good engagement and retention of patients with bipolar disorder.

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