FINAL REPORT

MOOD MECHANIC PROJECT

Scientific Title of Project
An open-trial, randomised controlled trial, and pragmatic evaluation of an internet-delivered intervention for reducing symptoms of depression and anxiety in young adults aged 18-24 years

Investigators
Professor Nick Titov
Dr Blake F. Dear
Dr Vincent J. Fogliati
Mr Matthew Terides
Dr Milena Gandy
Dr Lauren Staples
Dr Luke Johnston

June 2016
Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main Messages</td>
<td>3</td>
</tr>
<tr>
<td>Executive Summary</td>
<td>4</td>
</tr>
<tr>
<td>Main Report</td>
<td>6</td>
</tr>
<tr>
<td>Conclusions</td>
<td>16</td>
</tr>
<tr>
<td>Were the Project Aims and Objectives met?</td>
<td>17</td>
</tr>
<tr>
<td>Project Materials</td>
<td>17</td>
</tr>
<tr>
<td>Next Steps</td>
<td>18</td>
</tr>
<tr>
<td>References</td>
<td>18</td>
</tr>
</tbody>
</table>

“I really enjoyed the course and am grateful for the skills I learnt especially learning how to identify negative thoughts and challenge them! No suggestions on improvement :) … ”

*(Mood Mechanic Participant)*
Main Messages

“I think that in this generation, when many people seek answers to their problems on the internet, free access to these courses would be an important way to reach people that would otherwise not seek help, and a good stepping stone to prompt those that require additional assistance.”
(Mood Mechanic Participant)

- Anxiety and depression are highly prevalent among young adult Australians [1] and increase the likelihood of chronic mental health difficulties. They contribute to negative life outcomes including poorer workforce participation, income and living standards in older age [2,3].

- Traditional treatment seeking for mental health problems is considerably lower among young Australians adults [4]. Many of the reasons for low treatment seeking are similar to those observed among other sections of the Australian population and include stigma, poor mental health literacy, the direct and indirect costs, and geographical distance from appropriate services [5,6,7,8,9].

- There have been calls for the development of ‘youth friendly’ mental health services [4,9] and a growing acknowledgement that internet-delivered mental health services offer a unique opportunity for providing mental health treatment to young adults [10].

- The results of this beyondblue funded Project highlight the acceptability of internet-delivered cognitive behaviour therapy (iCBT) for young Australians adults as well as its clinical effectiveness for reducing clinical symptoms of anxiety and depression.

- More than 90% of participants found iCBT to be ‘worth their time’ and that they would ‘recommend it’ to others. Large clinical improvements in symptoms of anxiety and depression (e.g., > 40% improvements in symptoms) were also observed as a result of iCBT treatment. These improvements were maintained 12 months after participating in iCBT treatment.

- The results of the Mood Mechanic Course, which was used as the iCBT treatment in the current project, are now being replicated in a national online mental health service, the MindSpot Clinic (www.mindspot.org.au). The Mood Mechanic Course will continue to be offered as a routine service to thousands of young Australians for the foreseeable future.

- Carefully developed and proven iCBT treatments represent a very viable approach for increasing access to effective treatment and reducing the burden of anxiety and depression among young Australian adults.
Executive Summary

“I wish I had been taught about these skills in school so I didn’t have to go through it for so long. The course includes very helpful information which I will be able to carry with me for the rest of my life and use every day.”

(Mood Mechanic Participant)

Unfortunately, many young adults with anxiety and depression experience significant barriers in accessing evidence-based treatment. These barriers include stigma, poor mental health literacy, the direct and indirect costs and geographical distance from appropriate services. Regrettably, and as a consequence, many young adults live with disabling symptoms, which not only affect their quality of life but also their broader life trajectory.

The current beyondblue funded Project aimed to improve access to evidence-based treatment for young Australian adults with anxiety and depression. The Project, which began in 2012, involved the development, evaluation and delivery of an innovative internet-delivered cognitive behavioural therapy (iCBT) treatment, the Mood Mechanic Course, via three sequential clinical trials:

- The first clinical trial was a small single-group feasibility trial designed to determine the acceptability and potential effectiveness of the Mood Mechanic Course. The results of this first trial (n = 18) were very encouraging with very positive feedback from participants and evidence of good clinical outcomes. The results of this trial have now been published [11].

- The second clinical trial was a large randomised controlled trial (n = 192), which aimed to examine the acceptability and efficacy of the Mood Mechanic Course when offered in two formats: (1) with regular clinician contact via phone and email throughout the course; and (2) in a self-guided format without regular clinician contact via phone or email. In both formats participants received an initial ‘preparatory’ assessment and telephone discussion to ensure they knew how to work through and get the most out of the course. All participants were also monitored throughout the course. The results of this trial were also very encouraging with similarly excellent levels of acceptability and clinical improvements observed for both formats. The results of this trial are currently being formally analysed and written up for publication.

- The third trial was a large single-group real-world implementation trial (n > 470; recruitment ongoing), which aimed to examine the acceptability and effectiveness of the Mood Mechanic Course when offered as a routine service by a national online mental health clinic, the MindSpot Clinic (www.mindspot.org.au). This trial is ongoing. However, the available data indicate that, consistent with the findings of the research trials conducted at the team’s
specialist research unit (www.ecentreclinic.org), the Mood Mechanic Course is highly acceptable and clinically effective when administered in a routine service to high volumes of young adults with anxiety and depression.

The current Project has been enormously successful. It has highlighted the potential of internet-delivered treatment for young adults with anxiety and depression where little evidence for internet-delivered treatment previously existed for this age group. It has resulted in an acceptable and effective internet-delivered treatment, the Mood Mechanic Course, which is now available for free to young adults across Australia with anxiety and depression. It is anticipated that Mood Mechanic Course will be increasingly used into the future and will result in free treatment being provided to thousands of young Australians who might have otherwise never received treatment.
Main Report

“I liked the format of the course - it was very well structured and I liked the staggered release of modules. I have found myself coming back to the resources when I felt particularly out of control. I am very satisfied with the course and I am grateful that it was available - I now employ the skills in my daily life.”

(Mood Mechanic Participant)

Context
Planning for the Project began in 2012 based on several contextual issues:

- Epidemiological studies indicating anxiety and depression were highly prevalent among young adults with as many as 1 in 5 young Australian adults experiencing symptoms at clinical levels.

- Studies indicating that treatment seeking among young Australians was very low as a result of multiple barriers including stigma, poor mental health literacy, costs and limited services.

- Evidence indicating that untreated anxiety and depression significantly affect the life trajectories of young adults and are associated with multiple negative outcomes.

- Use of the internet and technology was very high among young adults – they are ‘digital natives’.

- There was an emerging body of evidence indicated that internet-delivered cognitive-behaviour therapy (iCBT) was effective for older adults and anecdotal evidence of effectiveness for younger adults from iCBT trials aimed at older adults but including younger adults.

- There was, however, uncertainty about the acceptability and effectiveness of iCBT treatments for anxiety and depression among young Australian adults.

The current Project therefore aimed to develop an iCBT treatment program for young adults, aged 18 to 24 years, experiencing anxiety and depression. The resultant treatment, the Mood Mechanic Course, was designed to be suitable for young adults with both clinical and subclinical levels of anxiety and depression. The Mood Mechanic Course was also designed to be made freely available to the public and to be trans-diagnostic in nature, that is, suitable for young adults with a broad range of different types of anxiety and a broad range of difficulties with their mood.
**Approach**

The Mood Mechanic Course was designed to:

- Offer good education about the symptoms of anxiety and depression as a way of increasing understanding about factors affecting emotional wellbeing.

- Teach practical and proven skills for managing anxiety and depression as well as improving emotional wellbeing and building self-confidence and emotional resilience.

- Provide a systematic approach and structure for learning information and skills. This system of treatment has been previously demonstrated to assist people to improve their emotional wellbeing despite their symptoms and multiple other competing priorities.

The initial Mood Mechanic Course was based on several other successful iCBT treatment programs also developed by the research team. A process of continual development was then employed across the trials in the current Project, where the feedback of participants and the experience of the supporting clinicians, was used to inform modifications to the Mood Mechanic Course; with the aim of enhancing its acceptability and effectiveness.

The Mood Mechanic Course was based on a pragmatic model of psychological distress that assumes that the symptoms of anxiety and depression are the result of unhelpful patterns of thought and behavior, which develop over time and often become a problem in the context of significant life events [see 12]. This model assumes the most acceptable and effective treatments are those that are structured, systematic and support the learning of new information aimed at understanding symptoms and the learning of cognitive-behavioural skills that help to manage symptoms. Thus, the Mood Mechanic Course was designed as a structured treatment that participants completed over a 5-week period (the most recent version used at the MindSpot Clinic is delivered over 8 weeks). Participants are supported to reflect on the information provided within the course and are strongly encouraged to practice the skills covered in the course, with the aim of adopting them into their everyday lives.

The Mood Mechanic Course comprises a number of components including Core Lessons and Do It Yourself (DIY) Guides. Each lesson is presented in a slide show format combining text, photos and diagrams with approximately 100 words per slide and 50 slides per lesson. The DIY Guides are text-based summaries of the lessons, which are printable and contain worksheets that help participants to learn the information and skills introduced within the lessons. Lots of additional resources are providing covering other important topics such as managing sleep, solving problems and communicating assertively. Detailed Case Stories are also provided based on the
experiences of previous participants who share information about the challenges they have faced and how they have used the skills within the course to manage their symptoms. Importantly, all Mood Mechanic materials are presented in both a didactic form, that is, in the format of text based instructions and information, and a narrative form, that is, in the form of real-world case stories and examples. Table 1 provides a summary of the content and structure of the most recent Mood Mechanic Course.
Table 1. Summary of Mood Mechanic Course

<table>
<thead>
<tr>
<th>Lesson</th>
<th>Lesson Content</th>
<th>Primary Skills Taught</th>
<th>Additional Resources</th>
</tr>
</thead>
</table>
| 1      | Education about the general prevalence and symptoms of anxiety and low mood. Introduction of a CBT model and explanation of the functional relationship between physical, thought and behavioural symptoms in psychological distress. Instructions for identifying their own symptoms and how their symptoms interact. Transdiagnostic vignettes and examples of anxiety and low mood symptoms provided. | - Symptom identification  
- Symptom formulation | - Sleep management  
- What to do in a mental health emergency  
- Transdiagnostic Case Stories |
| 2      | Introduction to the basic principles of cognitive therapy and importance of managing thoughts to manage anxiety and low mood. Instructions for monitoring and challenging thoughts related to anxiety and low mood. Transdiagnostic vignettes and examples of thoughts provided. | - Thought monitoring  
- Thought challenging | - Structured problem solving  
- Worry Time  
- Challenging beliefs  
- Transdiagnostic Case Stories |
| 3      | Introduction to the physical symptoms of hyper-arousal and hypo-arousal and their relationship to anxiety and low mood. Instructions about controlling physical symptoms using de-arousal strategies such as controlled breathing and scheduling pleasant activities. Transdiagnostic vignettes and examples of physical symptoms provided. | - Controlled relaxation  
- Pleasant activity scheduling | - Risk Calculation, Coping Calculation and Shifting Attention  
- 100 pleasant things to do  
- Transdiagnostic Case Stories |
| 4      | Introduction to the behavioural symptoms of anxiety and low mood. Explanation of avoidance and safety behaviours and their relationship to ongoing distress. Instructions for graded exposure for safely confronting fears and increasing activity levels. Transdiagnostic vignettes and examples of graded exposure provided. Information about the occurrence of lapses and the process of recovery from anxiety and low mood. Information about the signs of relapse and managing lapses. Instructions for creating a relapse prevention plan. Transdiagnostic vignettes and examples of lapses and lapse management provided. | - Graded exposure  
- Relapse prevention | - Assertive communication  
- Transdiagnostic Case Stories |

Table 1: Summary of Mood Mechanic Course

NOTE: There are two versions of the Mood Mechanic Course: a short version and a long version. The short version is presented above and is comprised of 4 lessons delivered over 5 weeks. The longer version is 5 lessons delivered over 8 weeks and covers the exact same information and skills, but provides participants with more time to work through the course and was developed based on participant feedback. In the long version, Lesson 5 is used to cover lapses and lapse prevention and Lesson 4 covers the behavioural symptoms only. In the long version, Lessons 1, 2, 3, 4 and 5 are available in weeks 1, 3, 4, 5 and 7, respectively; giving participants more time to work through Lessons 2, 4 and 5 which participants often requested.
**Results**

The results of the three clinical trials conducted as a part of this Project have been excellent. The results of the 3 trials are summarized below and in Figures 1, 2 and 3:

**Trial 1**
The first trial was a single-group feasibility trial involving 18 young adults (aged 18 to 24) which aimed to establish the acceptability and potential efficacy of the Mood Mechanic Course. High treatment completion rates were observed with more than 60% of participants completing the course within 5 weeks (with significantly more completing the course in the weeks after formal course completion). Post-treatment and 3-month follow-up data was provided by approximately 80% of participants ensuring confidence in the observed data. Highlighting the acceptability of the approach, all participants providing data indicated the program was ‘worth their time’ and that they ‘would recommend it’ to others. Evidence of large improvements was also observed in participant levels of anxiety (Cohen’s $d = 1.18$; avg. improvement = 55%) and depression (Cohen’s $d = 0.93$; avg. improvement = 48%), which were maintained until 3-month follow-up. Highlighting the potential cost-effectiveness of this approach, these results were obtained with an average of 37 minutes of clinician contact per participant across the entire course of treatment. See Figure 1 for a graphical overview of the outcomes.

**Trial 2**
The second trial was a large two-group randomised control trial involving 192 young adults and aimed to examine the acceptability and efficacy of the Mood Mechanic Course when offered in two formats: (1) with regular clinician contact via phone and email throughout the course (termed the clinician-guided); and (2) in a self-guided format without regular clinician contact via phone or email (termed the self-guided).

Formal analysis of the outcomes of this trial are pending as the long-term, 12-month, follow-up of participants is still ongoing. However, the preliminary results are very encouraging. High treatment completion rates were observed in this trial with 58% and 48% of the clinician-guided and self-guided groups completing the course within 5 weeks (with significantly more completing the course in the weeks after formal course completion). Post-treatment and 3-month and 12-month follow-up data was also provided by more than 75% of participants, again providing confidence in the outcomes observed. Importantly, more than 90% in both treatment groups indicated the course was ‘worth their time’ and that ‘they would recommend it’ to others. Large improvements in anxiety and depression were observed in both groups and all results were maintained until 12-month follow-up. However, highlighting the public health potential of the self-guided approach,
the average clinician time per participant was 34 minutes and 2 minutes in the clinician-guided and self-guided formats, respectively. See Figure 2 for a graphical overview of the outcomes.

**Trial 3**
The third trial was a large single-group real-world implementation trial of the Mood Mechanic Course, which aimed to examine the acceptability and effectiveness of the Course when offered as a routine service by a large online mental health service, the MindSpot Clinic.

This trial is still ongoing. The Mood Mechanic Course was implemented at the MindSpot in September 2015 and so far more than 470 young adults have participated in the course. Formal evaluation of the outcomes of this Mood Mechanic Course is pending. However, the preliminary data is very encouraging with similar levels of treatment completion, satisfaction and clinical outcomes being observed as in Trials 1 and 2. See Figure 3 for a graphical overview of the outcomes.
**Figure 1.** Graphical overview of outcomes from Trial 1

**Recommend To Others?**
- Yes: 100%
- No: 0%

**Lesson Completion (Post-Treatment)**
- Lesson 1: 61%
- Lesson 2: 28%
- Lesson 3: 11%
- Lesson 4: 0%

**Worth Your Time?**
- Yes: 100%
- No: 0%

**Depression Symptoms**
*(PHQ-9; n = 18)*
- Pre-Treatment: 12.94
- Post-Treatment: 6.71
- 3-Month Follow-up: 6.53

**Anxiety Symptoms**
*(GAD-7; n = 18)*
- Pre-Treatment: 12.61
- Post-Treatment: 5.71
- 3-Month Follow-up: 6.13
**Figure 2.** Graphical overview of outcomes from Trial 2

- **Recommend To Others?**
  - Yes: 97%
  - No: 3%

- **Lesson Completion (Post-Treatment)**
  - Lesson 1: 53%
  - Lesson 2: 16%
  - Lesson 3: 31%
  - Lesson 4: 0%

- **Worth Your Time?**
  - Yes: 94%
  - No: 6%

- **Depression Symptoms (PHQ-9; n = 192)**
  - Pre-Treatment: Clinician-Guided: 12.90, Self-Guided: 12.06
  - Post-Treatment: Clinician-Guided: 7.54, Self-Guided: 8.9
  - 12-Month Follow-up: Clinician-Guided: 7.72, Self-Guided: 7.45

- **Anxiety Symptoms (GAD-7; n = 192)**
  - Pre-Treatment: Clinician-Guided: 12.75, Self-Guided: 12.59
  - Post-Treatment: Clinician-Guided: 7.16, Self-Guided: 8.05
  - 12-Month Follow-up: Clinician-Guided: 7.18, Self-Guided: 6.79
Figure 3. Graphical overview of outcomes from Trial 3 (Ongoing)

Recommend To Others?

- 95% Yes
- 5% No

Lesson Completion (Post-Treatment)

- Lesson 1: 0%
- Lesson 2: 10%
- Lesson 3: 22%
- Lesson 4: 30%
- Lesson 5: 38%

Worth Your Time?

- 92% Yes
- 8% No

Depression Symptoms (PHQ-9; n = 215)

- Pre-Treatment: 14.70
- Post-Treatment: 9.60
- 3-Month Follow-up: 9.60

Anxiety Symptoms (GAD-7; n = 215)

- Pre-Treatment: 13.10
- Post-Treatment: 8.40
- 3-Month Follow-up: 8.40
Implications
The findings of the current Project have several important implications and these include the following:

- The internet-delivery of treatment is a promising approach for overcoming common barriers to treatment and reducing the burden of anxiety and depression among young Australian adults.

- Internet-delivered treatments are highly acceptable and effective for young adults, who engage well with these interventions, find them worthwhile and would recommend them to others.

- Good clinical improvements are observed whether these treatments are provided in a clinician-guided or self-guided format, provided participants are assessed prior to treatment and are monitored throughout.

- The clinical improvements observed in symptoms of anxiety and depression from internet-delivered treatments are maintained over the long-term among young adults.

- Internet-delivered treatments can be successfully deployed and disseminated as a part of routine clinical care for young adults with anxiety and depression. Thus, these treatments have real potential for the large numbers of young adults experiencing anxiety and depression.
Conclusions

“I think it’s really important that people have this information available to them - not just for those who are depressed and anxious, but for everyone! It is practical guidance that can help in every day and on a bigger scale. Not everyone can afford counselling services so this should be made available to them. People have a right to help themselves with knowledge.”

(Mood Mechanic Participant)

The key conclusion of the current Project is that the internet-delivery of treatment is acceptable, clinically effective and likely highly cost-effective for young adults with anxiety and depression. The current Project highlights the real public health potential of delivering treatment via the internet for young Australian adults.

It should be noted that the findings observed in the current Project are limited to the Mood Mechanic Course and the methodologies employed. It should also be noted that the results can only be generalized to the characteristics of the participants employed in the current trials, all of who were able to independently complete an online assessment and work through an online treatment. Consequently, caution is needed in generalizing the findings of the current Project too broadly at this point in time and especially to other iCBT treatments that have not undergone the same rigorous development, evaluation and implementation processes.

Nevertheless, the current project has been enormously successful and has provided much needed support for the potential of iCBT for anxiety and depression among young adults. The current Project has also led to the implementation of the Mood Mechanic Course at the MindSpot Clinic and is already being provided to young Australians with anxiety and depression across the country, entirely free of charge.
Were the Project Aims and Objectives met?

“yeah, the program is very easy and useful, anyone can try it!!”  
(Mood Mechanic Participant)

We are pleased to report that all of the Project aims and objectives have been met. The Project has been enormously successful. Reflecting this the Mood Mechanic Course is now being successfully used to improve the emotional wellbeing of young Australians with anxiety and depression.

Project Materials

“I found that the weekly exercises were the best. They truly helped me the most - forcing me to sit down and write down, and target, what was going on with my anxiety, helping to break it all down.”  
(Mood Mechanic Participant)

One iCBT Course was developed during the course of the current Project; The Mood Mechanic Course. Two versions of the course were created:

- Short version: 4 Lessons delivered over 5 weeks.
- Long version: 5 Lessons delivered over 8 weeks.

Importantly, both versions provide the exact same information and teach the same skills. However, the longer version presents this information over a greater number of lessons and weeks. This version was created in response to feedback from participants who wanted more time to work through the course. The longer version is now available as a routine treatment service via the MindSpot Clinic.
Next Steps

“...I found seeking information about dealing with anxiety quite difficult. There was no shortage of sites to diagnose you with ‘anxiety’ but when looking for information online I was re-directed to endless sites to purchase books or go see a GP. I found the option of an online course much less threatening ...”

(Mood Mechanic Participant)

The next steps include: (1) the ongoing provision of the Mood Mechanic Course via the MindSpot Clinic; (2) the ongoing collection of long-term follow-up data from participants in Trial 2 and the subsequent publication of the findings from this trial; (3) the formal evaluation of the Mood Mechanic Course when offered as a routine service via the MindSpot Clinic and the subsequent publication of the findings; and (3) the exploration of the collected data to inform the optimal provision and integration of the Mood Mechanic Course and similar treatments into the routine health care provided to young Australians with anxiety and depression.

References
“I think everyone should have access to this course, it is non judgement and private and can be done where ever you want in your own time”
(Mood Mechanic Participant)


