Research

Final Report

Project Title: Ensuring guideline-concordant monitoring of suicidal thinking and behavior after initiation of antidepressant treatment in 12- to 25-year-olds with depression (6505:10660)

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Main Messages

- The online self monitoring tool improved the quality of routine monitoring of depression symptoms and side effects, including suicidal ideation of young people being treated for depression via use of validated and recognised scales providing more comprehensive information.
- Client's depression symptoms and suicidal ideation improved at the same time and to a similar degree over time.
- Both clinicians and young people found the online self monitoring tool easy to use and useful, with the overwhelming majority liking the tool.
- Clinicians reported the online self monitoring tool as particularly useful for gaining a quick understanding of their client's risk with regard to suicidal ideation as well as their treatment progress, meaning they could more quickly focus on the client's needs in their treatment sessions.
- Clinicians reported that the online monitoring tool helped with engaging their clients because their clients seemed more willing to share how they were feeling in terms of symptoms, side effects and, importantly, their suicidal ideation online, meaning the clinician could address these issues. This highlights the potential for the online self-monitoring tool to improve outcomes for young people because clinicians are provided with more complete information and therefore the opportunity to make changes to their treatment plan in response to client's online sharing of symptoms, side effects and suicidal ideation.
- If fully incorporated into clinical practice, the refined tool has the potential to enable clinical practice that is in line with the *beyondblue* guidelines for the management of depression.

Executive Summary

It is critical that young people being treated for depression are monitored regularly in terms of depression symptoms (to track progress over time) and with regard to side effects and suicidal ideation, particularly those whose treatment includes antidepressant medication. Research has shown that those with untreated depression are at risk of suicide (Beautrais et al., 1996; Dunn and Goodyer, 2006; Fleischmann et al., 2005; Nock et al., 2008; Rihmer and Akiskal, 2006), and that young people treated with antidepressant medication are more likely to experience an increase in suicidal ideation and suicide attempts (Laughren, 2006; Dubicka et al., 2006; Hammad et al., 2006).

Despite this knowledge, and the existence of evidence based guideline recommendations that highlight the necessity of, and ideal practice in terms of monitoring, there is a large gap between what is recommended and what happens in every day clinical practice. Our own research undertaken in Melbourne, highlighted these gaps as well as a potential strategy that could assist clinicians to practice in a way that is consistent with guideline recommendations. This strategy was to develop a brief online self-monitoring tool that young people could complete that included standardised and validated measures of depression symptoms, suicidal ideation and physical and somatic symptoms, some of which are potential side effects of medication. This type of tool would address the gaps we identified relating to: 1. having access to standardised and validated tools; 2. clinicians not being confident about what physical and somatic symptoms to ask about; and, 3. only having limited time in a treatment session with a young person (the tool was designed to be completed prior to the treatment session). The first version of this tool was developed with young people and clinicians and initially tested in a small study with young people receiving treatment for depression.

The current study aimed to test whether the online tool enabled guideline concordant monitoring by investigating the practicability and usefulness of the tool and by examining what happened to depression and suicidal symptoms over time. This was a longitudinal cohort study (that is one group of participants was followed over time). It included regular client self-report of depression symptoms, suicidal ideation and physical and somatic symptoms including possible side effects of medication using the online monitoring tool over treatment course as well as an end-of-study client and clinician questionnaire about the acceptability and usefulness of the tool.

Results of the study showed that whilst improvements are still required to meet guideline recommendations for monitoring, the online tool did result in monitoring that used standardised and validated measures. Clinicians found the tool easy to use and useful with regard to gaining a more complete understanding of their client's symptoms, particularly with regard to risk. This enabled them to more quickly focus their treatment sessions to address the symptoms and needs of their clients as revealed via the client self-report on the online monitoring tool directly before the treatment sessions. Young people also reported that the tool was easy to use and useful and their feedback indicated that in some cases the online tool meant that they revealed symptoms and side effects, including suicidal ideation that they may not otherwise have reported in a face-to-face session with clinicians. Again, this highlights the usefulness of the tool in ensuring that clinicians have complete information about their client's symptoms, particularly with regard to risk.

It was apparent from the symptom scores collected from young people over the time that young people were being treated that both depression symptoms and suicidal ideation simultaneously improved over time and to a similar degree.

A refined (shorter) online self report monitoring tool, once fully integrated into clinical practice, has the potential to enable monitoring of depression symptoms and side effects, including suicidal ideation of young people being treated for depression that is in line with the *beyondblue* guidelines. The online tool facilitates the exchange of more complete information about a young person's depression and suicidal ideation symptoms and physical and somatic symptoms, including the side effects of medication. This allows clinicians to address risk issues in a timely manner and to focus treatment sessions on the most important and pressing needs of the client. In this way treatment outcomes are likely to be improved. Our results show that both clinicians and clients found the tool easy to use and useful, meaning it is more likely to be used in everyday clinical practice.

The Report

Context

In line with similar guideline recommendations internationally (National Institute for Health and Clinical Excellence NICE, 2005; American Academy of Child and Adolescent Psychiatry (AACAP), 2007), the *beyondblue* Clinical Practice Guidelines for Depression in Adolescents and Young Adults (McDermott et al., 2010) have a significant focus on the importance of monitoring depression symptom severity and adverse effects, particularly, suicidal ideation and behaviour, as well as mania after antidepressant medication is started (Recommendation 8 and Good Practice Point 20, 22, 23, 24).

This is very important because research has shown that not only are those with untreated depression at risk of suicide (Beautrais et al., 1996; Dunn and Goodyer, 2006; Fleischmann et al., 2005; Nock et al., 2008; Rihmer and Akiskal, 2006), but that young people up to the age of 25 who are treated with antidepressant medication are more likely to experience an increase in suicidal ideation and suicide attempts. (Laughren, 2006; Dubicka et al., 2006; Hammad et al., 2006). Research has also shown that relying on the unprompted report of side effects does not adequately ensure all young people at risk of suicide are identified, for example, in the TORDIA study (a randomised controlled trial for treatment-resistant, depressed adolescents) higher rates of suicidal (20.8% vs. 8.8%) and non-suicidal self-injury (17.6% vs. 2.2%) were identified with systematic monitoring. (Brent et al., 2009). However, despite the existence and dissemination of guidelines, it is widely recognised that evidence-based recommendations are often not followed in every day clinical practice (Grol, 2001). Furthermore, regular monitoring of symptoms and adverse events after the prescription of an antidepressant is vastly below what is recommended (Morrato et al., 2008).

Background

We conducted a study at Orygen Youth Health (OHY), a specialist mental health service for 15 to 25 year olds, to examine whether monitoring was undertaken by clinicians according to the National Institute Health and Clinical Excellence guidelines for the management of depression in children and adolescents (National Institute for Health and Clinical Excellence NICE, 2005), (the *beyondblue* guidelines had not been released at the time of the study). We investigated how many young people diagnosed with depression and treated with an antidepressant during the audit period (N=83) had at least one weekly follow-up contact with any clinician within the first four weeks of medication being prescribed. Our results showed that only twenty-five (30%) of 83 patients with a diagnosis of depression and receiving anti-depressants at some point during the audit period had a suicide ideation/risk assessment at least once a week for four weeks after the first prescription of anti-depressant. Twenty-nine (35%) of the 83 were assessed for depression severity at least once per week in the four-week period. Only one of these patients was assessed with a recognised scale (Hetrick et al., 2012).

We also conducted focus groups with the clinicians at the service to gain an understanding of the barriers to monitoring depression severity and adverse outcomes, including suicide risk. The results of the focus groups showed that overall, clinicians were generally confident that they were adequately monitoring clients' mental state and risk but acknowledged that in many cases, the monitoring of side-effects was a passive process that relied on spontaneous report from the client, or from general questions about side effects (Hetrick et al., 2011). Clinicians stated they were already required to complete large amounts of mandatory paper work and would be reluctant to take on more formal monitoring unless there were obvious clinical benefits, including encouragement for clients to self-monitor.

Self-monitoring of symptoms is increasingly becoming part of self-management programs in general health areas, (Bodenheimer et al., 2002a; Bodenheimer et al., 2002c; Bodenheimer et al., 2002b; Foster et al., 2007) and while it is a novel methodology in youth mental health, has been shown to be effective in improving depressive symptom scores in a study of adults with depression. (Ludman et al., 2003) In a study of self-monitoring of suicidal ideation in 18 to 24 year olds, self-monitoring was shown to be a valid measure of suicidal ideation and to be a factor in decreasing suicidal ideation in the absence of any additional active intervention. Importantly, and consistent with a body of clinical and research findings showing that asking young people about suicidal ideation does not increase their risk of suicidality, (Clum and Curtin, 1993; Hider, 1998; Kalafat, 2003; Thobaben, 1997; Shain B.N. & The Committee on Adolescence, 2007) self-monitoring of suicidal ideation did not result in an increase of suicidal ideation as a result of focusing on suicide.

There are two potentially important purposes of self-monitoring. One is ensuring that feedback is provided to the treating clinician who can assess and intervene in response to the feedback received. For example, a randomised controlled trial (RCT) has highlighted the effectiveness of providing feedback on a patient's progress during a course of psychotherapy to the treating clinician. This feedback meant patients had a better outcome, largely due to changes in the treatment plan as a result of the feedback. (Ludman et al., 2003; Lambert et al., 2001; Timimi et al., 2013; Bickman et al., 2011; van Sonsbeek et al., 2014). The other important purpose may be as a feedback mechanism for the patient, whereby they can learn about their levels of depression or suicidal ideation in relationship to their current circumstances, thus educating them about the conditions under which mood and suicidal ideation change. (Clum and Curtin, 1993).

To address the gaps between evidence based guideline recommendations and day-to-day clinical practice and identified barriers, and based on previous research on self monitoring, we developed an early version of an online tool for self-monitoring of depressive symptom severity and adverse effects, including suicidal ideation and mania symptoms. In a series of focus groups, this early version of the tool was presented to: a focus group of past and present users of the OYH service, Youth Mood Clinic (YMC) clinicians, as well as primary care practitioners and academic GPs (Hetrick et al., 2014). It was also tested in a preliminary study on 15 current clients of the YMC (Hetrick et al., 2013). Adjustments were made to the tool in response to feedback.

Implications

Distribution of guidelines does not necessarily result in clinicians including recommendations in their practice; but if shown to be effective and useful, the online tool could be rolled out to all relevant services increasing the changes to monitoring so that they are consistent with guideline recommendations, which would help ensure effective treatment and risk management of these young people. An effective online self-monitoring tool for young people will allow more systematic and careful monitoring of depression symptom severity, adverse effects and suicidal ideation and behaviours. It will allow both young people and clinicians to be more aware of the potential adverse effects of medication, allowing the timely identification and management of these, thus reducing the risk of suicidal events. Recent research has also highlighted the effectiveness of clinicians having access to data regarding the progress of their clients such that they can alter treatment plans if improvements are not being achieved (Timimi et al., 2013; Bickman et al., 2011; van Sonsbeek et al., 2014).

Approach

Setting

The study was conducted at primary, secondary and tertiary mental health settings: the Peninsula Family General Practice (PFGP); two local **headspace** centres (Sunshine and Glenroy), and the Youth Mood Clinic (YMC) at Orygen Youth Health (OYH).

Sample

Eligibility: young people aged 12 to 25; with depressive symptoms as assessed and documented by their clinician with a Patient Health Questionniare-9-item (PHQ-9) score of 5 or more indicating at least mild depression; receiving any kind of psychological therapy (+/- antidepressant medication); and had attended at least 5 sessions with their therapist. A pragmatic approach was taken, and as such, co-morbidity was not an exclusion criterion. The only exclusion criteria were an inability to use a computer due to physical disability, insufficient English language skills to complete the online tool and a documented IQ below 70.

Development of the tool

The content of the tool was broadly based on guideline recommendations that state that symptoms and side effects, particularly suicidality, be assessed regularly (McDermott et al., 2011).

To monitor depression symptoms the PHQ-9 was included. This was chosen as it was being used in the YMC; it is a brief measure; and has been used in many studies with young people to assess mood symptoms both in the context of screening for depression and as an outcome measurement tool. Additionally, a scale of 1 to 10 was included as this is often how clinicians

assess mood in a face-to-face session.

A brief (3-item) suicidal ideation symptom measure was developed on the basis of the tool developed and tested by Clum & Curtin (Clum and Curtin, 1993). The items were designed to assess the strength, duration and level of control the young person felt they had over the suicidal ideation. It was originally developed for an American college population (18 to 24 year olds); we adapted it to suit both the Australian context and a larger age range (12 to 25).

We included what is considered a gold standard suicidal ideation symptom measure; the Suicidal Ideation Questionnaire-Junior (SIQ). The selection of this tool was on the basis of consideration of systematic review of interventions for the management of suicide risk, which showed the SIQ was the most appropriate, common and well validated measure.

The tool also includes a list of possible physical side effects of antidepressant medication. This was based on The Antidepressant Side-Effect Checklist (ASEC), which was originally constructed as a self-report instrument to measure 21 adverse reactions to antidepressants. We included other questions that were commonly used in trials of selective serontonin reuptake inhibitors (a type of antidepressant). In particular, we wanted to include items suggestive of manic or hypermanic symptoms given these are of great concern as a potential cause of suicidality in youth started on antidepressants (Rihmer and Akiskal, 2006). These items were developed in discussion with the senior psychiatrists in the YMC to ensure they were as clinically relevant as possible.

Tools used to assess manic or hypermanic symptoms in young people have been heavily criticised (Hirschfeld, 2010); therefore we chose to included the Mood Disorder

Questionnaire (MDQ), a self-report screening measure which was developed and validated in adults (Hirschfeld et al., 2000) and has been widely used in clinical settings, research and in the general population (Hirschfeld, 2010).

In addition, cognitive (thinking/reasoning) symptoms were assessed. In the adult literature there remains ongoing debate about the extent to which antidepressants harm or improve cognitive performance on objectively measured tests of cognitive functioning (Herre-Guzman et al., 2010; Paul et al., 2007; Hindmarch, 2009). However, antidepressant use in adults has been associated with self-reported cognitive problems in treated patients, which have been shown to affect treatment compliance/tolerability (Bolling and Kohlenberg, 2004). The self-reported cognitive effect of antidepressants in children and adolescents is yet to be investigated. What has been shown is that depression does affect cognitive functioning in young people in a range of areas including attention and concentration, processing speed, memory and executive functioning (Holler et al., 2013; Matthews et al., 2008; Maalouf et al., 2011; Baune et al., 2012a; Austin et al., 2001; De Luca et al., 2003; Purcell et al., 1997). Therefore we designed a set of questions to incorporate these key cognitive domains with a focus on those known to be affected by depression. The aim was that the set of questions was as brief as possible and used plain language to reduce the impact of literacy problems and low IQ.

Procedure

Eligible and consenting clients were mailed participant consent forms, and versions for their parent or guardian (if aged under 18), with instructions to bring the signed forms to the next appointment with their clinician. Consent was then obtained from clients' clinician to be a clinician participant. Before their next appointment the study research assistant met the

participant and clinician and facilitated the participant to complete the monitoring tool on an iPad. Completion time was approximately five minutes. The clinician also completed some basic questions confirming the young person's diagnosis and whether or not they were on medication.

Management of Risk

After completion of the online tool, the clinician checked the depression and suicidal ideation scores. These were presented with explanations as to the level of severity and the numerical score represented. If the young person completed the suicidal ideation items in a way that suggested significant suicidal ideation, the clinician was informed and then undertook a risk assessment and implemented standard risk management protocols.

Ethics

This study received ethics approval from the Melbourne Health Research and Ethics Committee (reference number 2010.240) and conforms to the provisions of the Declaration of Helsinki (as revised in Tokyo 2004), available at http://www.wma.net/e/policy/b3.htm.

Analysis

Frequency data and descriptive statistics (means and standard deviations) were used to assess how often young people used the tool and client and clinician rated usefulness and acceptability. Paired samples t-tests were used to examine how depression and suicidal ideation symptoms (measured using the PHQ-9 and SIQ-JR) resolved over time, and the relationship between depression symptoms and suicidal ideation was examined using Pearson product moment correlation coefficient. Item reduction was undertaken using factor analysis

to investigate the underlying components of the scale and Rasch Analysis to assess the suitability of the response scale and assess the fit of each of the items.

Results

Does the online self-monitoring tool facilitate guideline concordant monitoring?

One hundred and one young people filled in the online monitoring tool. However, due to prioritisation given to a competing Randomised Controlled Trial (RCT) in our recruitment sites, a number of young people were restricted to only completing the tool once. Sixty-two were able to fully participate in the study; of these, the number of times they completed the tool (on a weekly or near weekly basis) was between 2 and 8 times (mean 3.3; SD=1.46). The number of young people who completed 4 or more times was 21 (34%). This is a similar finding to that of our audit study that showed that only 30% of young people had a suicide risk assessment and 35% had a depressive symptom assessment at least once a week for four weeks; however, in the audit study only one client had been assessed using a validated scale whereas in the current study gold standard and validated tools were used. Further, the online monitoring tool was not integrated into the tools and systems used in the clinical setting where we were seeing young people, with such integration likely to further improve monitoring.

We have now undertaken item reduction with regard to the physical and somatic side effects, reducing the number of items from 39 items to 18 items (paper in preparation). Further analysis is currently underway to validate a 1 to 10 depression severity measure against the PHQ-9 and to validate a 3-item suicidal ideation measure against the SIQ-JR; therefore the potential exists for the tool to be reduced from 28 depression and suicidal ideation items to 4.

Additional results from the study

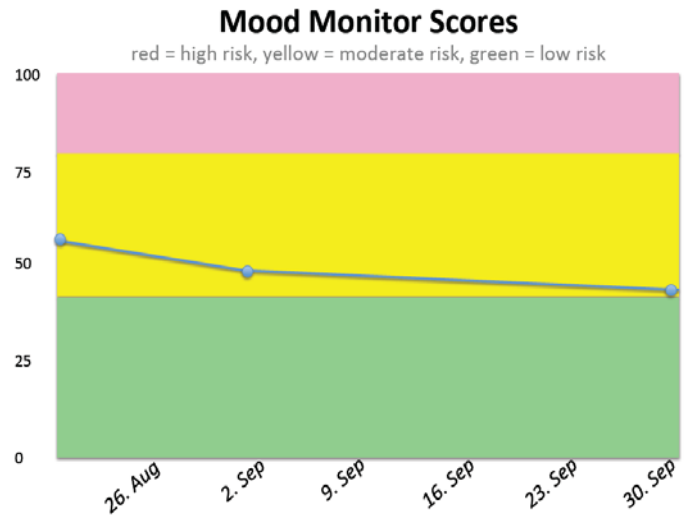
A pioneering aspect of this study was the collection of self-reported cognitive symptoms, given the known impact of depression on cognitive functioning, particularly in the areas of executive functioning (verbal abstract reasoning, planning, problem solving and impulse inhibition) but also in other cognitive domains, including attention, processing speed, memory and language functioning (Baune et al., 2012b; Brooks et al., 2010; Cataldo et al., 2005; Klimkeit et al., 2011; Maalouf et al., 2011; Anderson et al., 2001). Self reported ratings of cognitive functioning showed perceived improvements, by 40 percent of the respondents or more, in the areas of planning and organisation and motivation to do activities. Differences based on depression severity were observed. Participants with mild to moderate depression were more likely to self-assess improvements in their neuropsychological functioning, and less likely to self-assess neuropsychological deterioration than their more severely depressed counterparts (paper in preparation). These differences reached statistical significance in the areas of wakefulness/alertness, attention and concentration, working memory/multi-tasking and motivation. Whether or not participants were on medication made little difference to their perceptions; this is in contrast to adult findings that medication results in perceptions of worse neuropsychological functioning (Bolling and Kohlenberg, 2004). Understanding how young people perceive their neuropsychological functioning could also help in ongoing treatment planning by enabling clinicians to determine when it is best to use more effortful techniques such as the cognitive aspects of cognitive behavioural therapy.

Feasibility and utility of an online self monitoring tool as a strategy to facilitate implementation

Twelve clinicians completed a questionniare about the practicability and usefulness of the online monitoring tool. All of the clinicians said they found it easy to fill in the tool, that they

liked it, and that they found it useful. The tool was designed to provide clinicians with immediate feedback about their clients scores on the PHQ-9, SIQ-JR and physical side effects at the time the client completed the tool, as well as a graph showing the trajectory of symptoms for that client over time (See Figure 1).

Figure 1: screen shot of graph of depression symptoms over time



Ninety-two percent of clinicians said they found that receiving the scores improved their understanding of their clients symptom severity and risk (see Figure 2); 50% said that receiving scores improved their understanding of their clients physical symptoms and side effects (see Figure 3) and overall 75% of clinicians said it improved their treatment planning (see Figure 4).

Figure 2: Percentage of clinicans who stated their understanding of clients symptom severity and risk improved from receiving client self report scores (n=12)

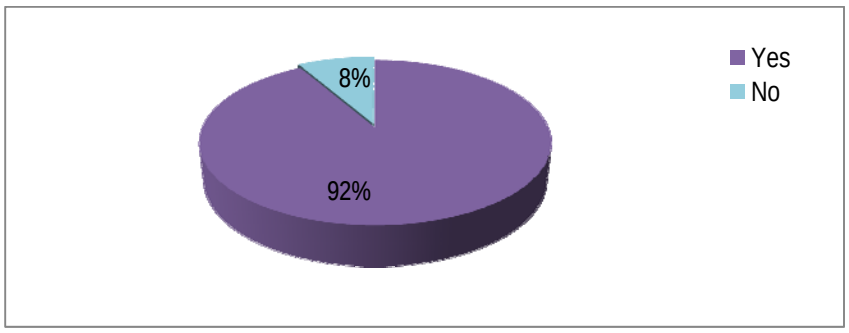


Figure 3: Percentage of clinicans who stated their understanding of clients physcial symptoms and side effects imrpved from receiving client self report scores (n=12)

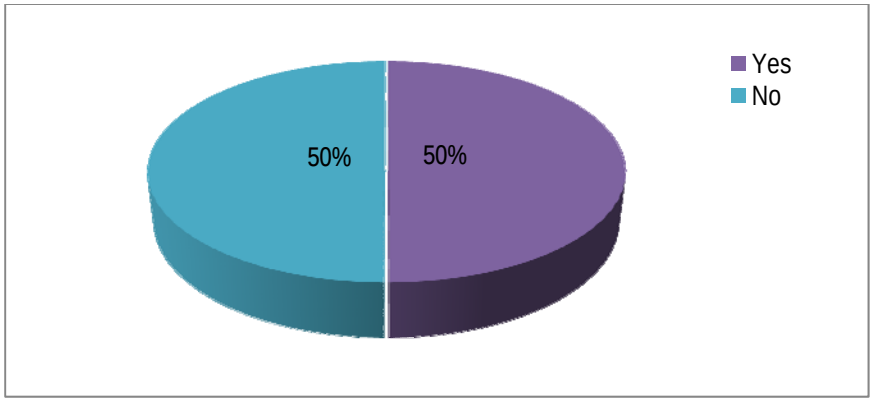
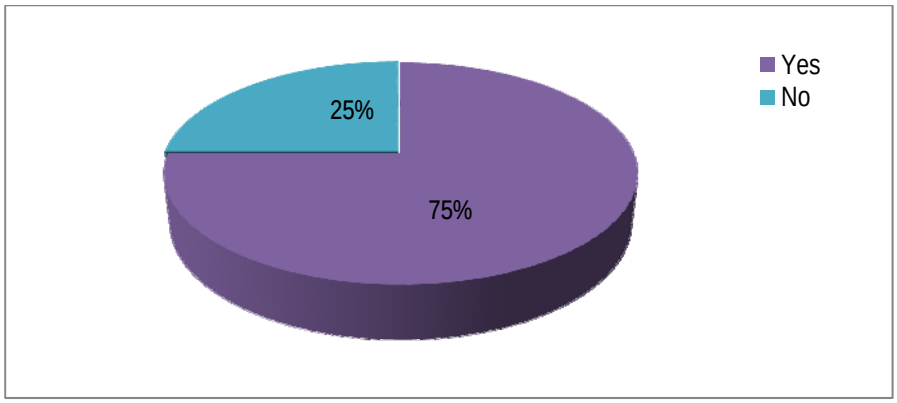


Figure 4: Percentage of clinicans who stated that receiving self report scores informed their treatment planning (n=12)



Qualitative comments about the tool supported these findings and indicated that it was useful to have an indication of risk immediately prior to their session to be able to direct the session content, for example clinicians stated that: “helps to start discussion about risk right away in session, maximising clinical time”; “very helpful with one client who found it difficult to disclose risk face to face”; “it was … helpful to read the results prior to going into session to have an idea of what to expect”. This is consistent with previous research showing that feedback on a client’s progress has the potential to improve outcomes because clinicians have

the opportunity to make changes to their treatment plan if necessary (Ludman et al., 2003; Lambert et al., 2001; Timimi et al., 2013; Bickman et al., 2011; van Sonsbeek et al., 2014).

Clinicians were keen to see the project expanded, but felt the tool could be shorter and that presenting more of the information in graphs would improve its use. As stated, we have undertaken the appropriate analyses to reduce the number of items in the tool; with further potential reductions possible subject to further planned analyses. Clinicians were also keen to have the information in a way where they could present it to clients if appropriate, and to receive client's scores in real time i.e. how clients were "tracking on a day-to-day basis". This suggests the need for the tool to be fully integrated into the systems and processes currently used in clinical practice, a theme evident in the focus groups undertaken with GPs (Hetrick et al., 2014). It is likely that a shortened tool, fully integrated into clinical practice would greatly improve compliance with guideline recommended monitoring.

Fifty-five (89%) young people completed an evaluation form at the end of the study; of these, 87% found the online monitoring tool easy to use, 96% liked the tool, and 87% found the tool useful (see Figure 5). Seventy-three percent said that filling in the tool helped them understand more about their symptoms (see Figure 6), particularly how they changed in response to things that were happening in their lives, and 49% said that they felt more in control of managing their symptoms by filling in the tool each week. Seventy-eight percent said that they felt reassured that their case manager knew everything they needed to know because they had filled in the form. Comments from young people overwhelmingly supported the ease of its use e.g. "It was easy to use" and "it was quick and simple" as well as its utility in terms of focusing their treatment session e.g. "[it] saved a bit of time during the session"; "[it was] helpful to identify what I wanted to talk about in the session and helped me to ask

questions"; and "I thought it was a great way to express feelings I didn't necessarily have the confidence to say out aloud". Young people also reported that they liked seeing evidence of their improvement e.g. "I think it was good in terms of tracking my progress, on completion of my treatment it was good to see the graph on the iPad that proved treatment had been effective" (see figure 1 for example) and made statements regarding the usefulness of the tool in terms of improving communication with their case manager". However, there were some improvements that young people thought could be made, mostly in regard to its length e.g. "It's a bit long sometimes"; "at times it could be tedious due to the large amount of questions". Again, the tool can now be reduced in terms of item-number reducing the burden on young people and making it more likely to be used regularly and routinely. Results support previous research with regard to its potential to enable improvements in depression and suicidal ideation for young people using the tool (Clum and Curtin, 1993; Ludman et al., 2003).

Figure 5: Percentage of young people who found filling in the online self-monitoring tool useful (n=55)

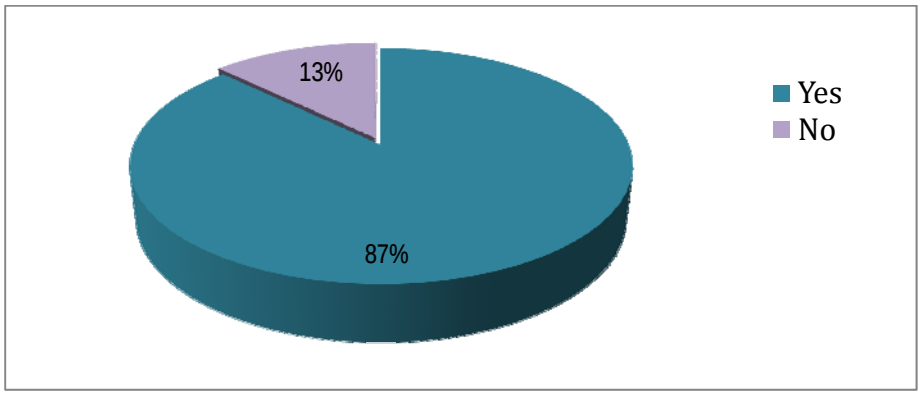
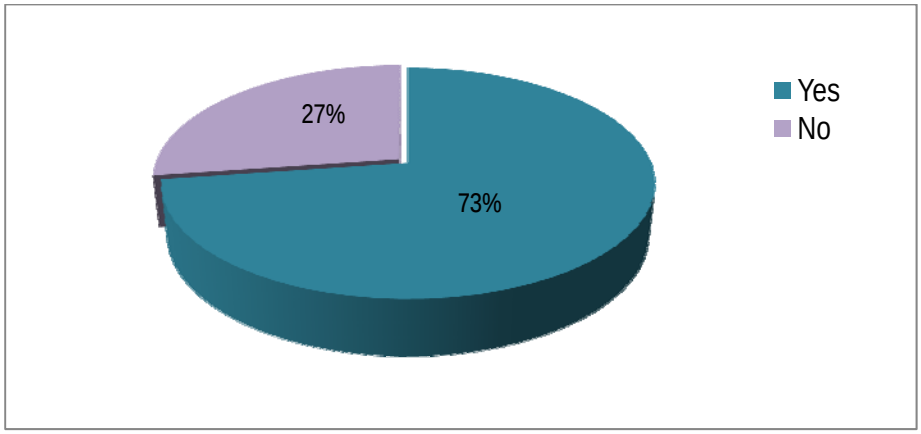


Figure 6: Percentage of young people who found filling in the online self-monitoring tool helped them understand more about their symptoms (n=55)



Trajectory of symptoms and suicidal ideation during treatment of depression

Paired samples t-tests were conducted to examine the changes in suicidal ideation and depressive symptoms from baseline (when the young person first completed the tool) to the final measurement point (the last time that a young person completed the tool). A statistically significant result was seen on both measures, with large effect sizes (Eta squared=.22 for SIQ-JR; Eta squared=.09 for PHQ-9).

Table 1: Pre and post depression (PHQ-9) and suicidal ideation (SIQ-JR) scores and paired t-test results

	Baseline scores Mean (SD)	Final scores	df	t	p
SIQ-JR	34.32 (23.82)	29.24 (21.25)	61	4.20	.000
PHQ-9	15.10 (5.79)	12.45 (6.21)	61	2.46	.017

There was a strong positive correlation between scores on the PHQ-9 and scores on the SIQ-JR at baseline (r=.724, n=62, p=.000) and at the final measurement point (r=.616, n=62,

p=.000). This indicates that depressive symptoms and suicidal ideation resolve at the same time, with both demonstrating large effects sizes i.e. improvements of similarly large size.

If the online tool is adapted to be very brief (on the basis of the results from this study(and is integrated fully into clinical systems, it has the potential to allow for data on large numbers of young people's depression and suicidal ideation symptom fluctuation over time to be collected. This would allow a greater ability to more closely look at how the course of symptoms is affected by the severity of depressive disorders and the type of symptoms that young people initially present with as well as the impact of different treatment strategies.

Additional Resources

Over the time in which this study was being conducted, several important papers have been published highlighting the potential usefulness of outcome measurement in clinical services for young people (Timimi et al., 2013; Weisz et al., 2011). These studies have used patient-important outcomes rather than symptom severity measures to track treatment progress. Both have highlighted the potential for using outcomes identified by young people as most important to them in understanding treatment progress over time. Both studies highlight the potential for improved patient outcomes when the clinician is able to see how their client is progressing over time in terms of the outcomes identified as most important to the young person.

Further research (Gaps)

A large cluster randomised controlled trial is required to test the effectiveness of the online self report monitoring tool in: 1. Improving compliance with guideline recommendations;

and, 2. Improving outcomes for young people with depression. A randomised design is generally considered the most reliable method for measuring the effectiveness of an intervention since, when properly applied, it avoids selection and confounding biases (Grimes and Schulz, 2002). A clustered design, with clusters being clinical centres (where young people with depression are seen for treatment) is ideal since the implementation strategy will be targeted at clinicians. Randomising centres will reduce contamination arising from (i) clinicians concurrently managing intervention and control patients, as would occur in a patient randomised trial, and (ii) clinicians within the same practice receiving the online monitoring tool or control intervention, as would occur if clinicians were randomised. Outcome assessment will be at the level of the clinician to determine whether the online monitoring tool results in a change in practice, and at the level of the client to determine if changes in practice impact on patient outcomes.

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