

The potential use of digital monitoring of patients' progress alongside psychosocial interventions in self harm: a pilot study

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ABSTRACT

Background

With over 200,000 presentations to hospital for self-harm each year in England, there is a clear need for action to reduce self-harm and improve well-being in this population. This pilot study examines the potential for digital self-monitoring of wellbeing as an adjunct to psychological supportive therapy.

Aim

To ascertain the usefulness for both patients and clinicians of a digital self-monitoring component alongside outpatient follow up following presentation to the general hospital with self-harm.

Method

Investigation of patient's use of digital technology to self-monitor mood, suicidality and self-harm. Collection of feedback from patients and clinicians regarding their experience of using the technology.

Results

The patients who used the digital self-monitoring technology mostly found it useful and easy to use, as did the clinicians. This method of recording of progress has now been incorporated into routine clinical care

Conclusion

The use of electronic real-time monitoring of mood, thoughts of self-harm and suicidality alongside a psychological intervention is a useful component of patient care.

Keywords

Digital self-monitoring, self-harm, aftercare

BACKGROUND

It has been estimated that there are more than 200,000 general hospital presentations for self-harm in England per year (Tsiachristas et al, 2017). Approximately a quarter of patients will re-present to hospital within 12 months following further self-harm (Geulayov et al, 2016). Patients who self-harm have a considerably increased risk of future suicide than the general population, especially during the first few months after leaving hospital (Geulayov 2019). They are also at greater risk of premature death than the general population, often due to issues relating to their physical health and lifestyle choices (Bergen et al 2012). This is clearly a major public health problem.

There has been considerable research into what can reduce self-harm and improve well-being of this patient group. Brief psychological interventions, including problem-solving therapies, are pragmatic and an effective approach for reducing self-harm, depression, hopelessness and suicidal ideation (Hawton et al 2016). There is also evidence from Denmark that provision of psychological interventions can be effective in routine clinical care (Erlangsen et al 2015). With very large numbers of patients presenting with self-harm to hospitals in England and a shortage of clinicians to provide psychological therapies following discharge from hospital there is a major need to provide such help, where possible, through the clinical services which provided the psychosocial assessments of patients while they were in hospital.

Typically, in England, self-harm services are multi-disciplinary and available seven days a week, often 24 hours a day. One such service is the Emergency Department Psychiatric Service (EDPS) in Oxford. This based in a large general teaching hospital. EDPS is staffed by Band 7 mental health nurses, junior doctors and consultant psychiatrists. EDPS offers

psychosocial assessment to anyone aged over the age of 13 years who presents to hospital with self-harm (or any other mental health problem). Following patient assessment, a discharge plan is formulated in collaboration with the patient. Patients who do not meet the criteria for referral onto secondary mental health services but require more than non-statutory services or primary care may be offered follow up with the 'Brief Interventions for people at Risk of further Self Harm' (BIRSH) programme, which is facilitated by the by the EDPS team.

BIRSH is a nurse-led service which is delivered by nurses within the EDPS team. The BIRSH service treatment programme consists of a maximum of six sessions of therapy with the assessing nurse carried out at the general hospital in outpatient rooms (or via skype). The therapy content is patient led, dependent upon their current difficulties, but covers issues relating to repetitive self-harm, alcohol misuse, bereavement, anxiety, and depression. The underpinning value of the BIRSH clinic is of validation with a strong problem-solving theme. Validating the distress that someone is experiencing and supporting them to resolve their current issues can be powerful in reducing overall distress. The BIRSH intervention has been shown to be a contributory factor in reducing self-harming behaviour for those who engage with it (Brand & Lascelles 2017). All patients who attended two or more follow up BIRSH sessions following their attendance at the emergency department (ED) with a presentation of self-harm had a subsequent reduction in presentations to the ED during the six months post intervention, compared to the six months prior to the intervention. This suggests the potential value of the intervention in reducing self-harm presentations.

Digital health technologies are another potentially valuable way to help transform mental healthcare by connecting patients, services and health data in new ways. Digital online and

mobile applications can offer patients greater access to information and services and enhance clinical management and early intervention through access to real-time patient data (Hollis et al, 2015).

One such example of how digital health technologies can be used to provide support to both patients and clinicians is through the use of True Colours. This is an online self-assessment system that allows patients to monitor their symptoms using text, email and the internet (Goodday et al, 2020). The patient creates a record of their mood and mental state, which they can monitor over time to assess their progress and to flag any unusual trends. This can be used to assist patients and clinicians in managing patients' mental health needs and requirements.

We wanted to explore the possible benefits of adding this digital self-monitoring component to the BIRSH clinic intervention, since there is little evidence that digital self-monitoring has been used with this patient population. As a result, we worked alongside the True Colours team to devise questionnaires to collect data weekly, digitally, directly from patients. The aim of this was to monitor patient's mood, mental state and self-harm and suicidal thoughts and behaviours. We wanted to explore whether this self-monitoring system was acceptable to both patients and clinicians and if it was feasible to implement alongside the established BIRSH clinic, and whether patients and clinicians found it helpful.

METHOD

The study was conducted through the service for self-harm patients at a large general hospital in Oxford over 12 months. We invited patients who had agreed to BIRSH follow up to complete a baseline True Colours questionnaire in the ED following their receiving a psychosocial assessment, with a view to them completing this questionnaire via email on a

weekly basis. The purpose of this was to provide the nurse specialist and the patient, with an initial baseline which could be benchmarked against subsequent weeks. It also allowed the patients to become familiar with how to use the True Colours system. Each week patients were emailed reminders prompting them to complete the True Colours questionnaire.

The questionnaires we used for the True Colours monitoring were the modified Patient Health Questionnaire (PHQ-9) (Kroenke et al, 2001), with four additional questions regarding thoughts of and actual self-harm and thoughts of and plans made for suicide, and the positive anxiety items from the Hospital Depression and Anxiety Scale (HADS); (Spitzer et al, 2006). These are shown in the Appendix. This system can also be used to record medication, therapy sessions, self-harm episodes and major life events. If a patient responds yes to the “have you made any preparations to end your life?” question then this does bring up a box prompting the participant to seek help from either their GP or the Samaritans.

Five nurses that had substantive posts in the EDPS team were the clinicians that recruited participants to the study. Participants were recruited to the pilot if they were eligible for BIRSH follow up. Convenience sampling was used. All participants that were eligible were invited to join the pilot.

A target recruitment of 6-10 patients was deemed suitable for the pilot study. In the event we recruited 12 patients to the study.

Data collection

In addition to the True Colours records, paper questionnaires were distributed to patients at the end of their BIRSH intervention to gain feedback on their experiences of using this

recording system. This questionnaire contained six questions: which included a mixture of Likert scale questions, binary questions and open-ended questions. (see Appendix). Patients who were not able to attend the final BIRSH session were posted the questionnaire with a stamped addressed envelope to return it.

We also collected feedback via a questionnaire from the clinicians who delivered the BIRSH and True Colours during the pilot period. There were five questions, a mixture of Likert scale, binary questions and ended question (see Appendix). All the clinicians that had delivered BIRSH with the True Colours adjunct completed a questionnaire.

Data analysis

Descriptive statistics were used to analyse the data. In addition, text responses were thematically analysed. Microsoft Excel was used as a data management tool. The analysis was carried out primarily by the study lead (FB).

RESULTS

During the pilot 15 patients were offered BIRSH with True Colours monitoring. Two patients declined as they did not have the technology to access the intervention, one declined as they did not want the pressure of the weekly email prompting them to complete a questionnaire. The remaining 12 patients accepted the BIRSH intervention and True Colours self-monitoring.

The participants were largely female (N = 10; 83.3%). Most were aged between 18 and 35 years (N = 10; 83.4%). All but one (N= 11; 91.6%) of the participants had self-harmed previously. The characteristics of the participants are shown in Table 1.

(Table 1 about here)

Two-thirds (N=8) of the participants attended three or more BIRSH sessions. Four did not attend any aftercare appointments, but one of these used the True Colours system.

Patients' use of True Colours

A total of nine patients used the True Colours system. Examples of two participants' True Colours records are shown in Figures 1 and 2. The records show the therapy period and repeat episodes of self-harm. For the PHQ-9 and HADS scores the higher the score the worse the mood/anxiety. Life events can be added in, as well as medication changes and additional questions, if a patient wishes.

(Figures 1 and 2 about here)

The highlighted period in Figure 1 shows when this patient was actively engaged in aftercare. This was associated with improvements in their mood and anxiety scores from baseline. The patient lost their job during week 9 which was followed by a deterioration in their mental state for a short period of time and also a repeat episode of self-harm. After therapy ended their mood/anxiety fluctuated, with their ratings indicating generally worse levels than during therapy.

The patient shown in Figure 2 engaged in further self-harm before therapy began and in the first couple of weeks after it started. Then in week 7 they experienced a relationship breakdown which was followed by an increase in anxiety scores but an increase in depression, reflected in the graph.

Both these patients continued using the True Colours system for many months after their BIRSH intervention had ended.

(Figures 1 and 2 about here)

Participants' feedback on use of True Colours

All of the participants who attended more than two therapy sessions (N=8) found the weekly True Colours questionnaires easy to use and helpful.

"...it was really easy to use, the questions and options were very clear and understandable. Keeping track of my mood made me more conscious of how I was feeling and my emotions, which was useful – especially looking back over the weeks. The graph with reference points visually demonstrated was very useful and interesting. It enabled me to better understand myself and recognise patterns in my mood" (Participant 2).

All of these eight participants reported finding it useful to be able to look at their responses.

Seven of the participants reported experiencing no problems completing their weekly True Colours questionnaires. All eight participants said that they would recommend this to others in a similar situation.

"really helpful to be able to see how I'm doing each week, easy way to keep a record of progress and problems. Easy to use, I'd like to carry on!" (Participant 4).

Two participants made suggestions on improving the True Colours system.

"it would be really useful to get an overall rating from the system to see if you are improving" (Participant 5).

One patient commented that some of the scales used in the digital monitoring were repetitive and that they would have liked more open-ended questions.

Clinicians' feedback on use of True Colours

Four of the five clinicians found recruitment and explaining the benefits of True Colours to participants easy. One clinician found registering the participant on the True Colours system difficult. All the clinicians that had used True Colours in the BIRSH intervention found it useful. Examples of clinicians' comments on using True Colours were:

“I found this to be crucial/beneficial as it showed stages, improved areas for support/future input and it allowed them (participant) to see how far they had come” (Clinician 2)

“participants who engaged well with it and had been preparing and reflecting ahead of the session” (Clinician 4)

DISCUSSION

The findings from this pilot study suggest that both patients and nurses found the use of a digital self-management tool to monitor in real time and in a structured way patients’ mood, thoughts of self-harm and suicidality alongside a psychological intervention to be of use.

From the narrative feedback clinicians were able to utilise the True Colours data in the BIRSH sessions and work with the participants, using the real time data. This helped to give structure to the BIRSH sessions and also gave the participant a sense of ownership and responsibility with regard to reliably recording their data. It assists both patients and clinicians to monitor changes in mood and suicidality over time and to recognise how these relate to life events, changes in treatments and other occurrences.

While numerous types of digital health interventions are available to patients and the public, many factors affect their ability to engage and enroll in them (O’Connor et al, 2015). Some potential participants in our study were excluded from being offered the True Colours intervention because they would not be able to reliably self-monitor their mood and mental state e.g. due to their mental state or the possible triggering nature of some of the questions. Also, a few individuals lacked the technology needed (i.e. a mobile phone). Patient engagement with technology, educational content and self-care behaviours influence outcomes of digital health interventions (Shan et al, 2019).

Although the results of the initiative cannot be generalised to the overall self-harm population due to the relatively small size of the patient sample, they do provide us with preliminary findings about the usefulness of True Colours when used as an adjunct to outpatient follow up. The findings of this initiative can be built on in future research where the use of True Colours monitoring can be tested in a larger population group to ascertain if it should be offered to all self-harm patients who require follow up, whatever the nature of the intervention.

In terms of the content or the True Colours measures used in this study the PHQ-9, with the added questions about self-harm, these appeared to work well. While we used items on anxiety extracted from the Hospital Anxiety and Depression Scale, it might be preferable to use a complete short scale for this purpose, such as the General Anxiety Disorder Assessment (GAD-7) (Spitzer et al, 2006). In this study, patients were asked to do their True Colours ratings weekly. Because things can often change rapidly, we believe that twice weekly recording might be preferable.

Limitations

The main limitation of this pilot study is the small sample, but hopefully our results will stimulate further work on this approach and its adoption in other centres. The True Colours system itself is not monitored or regularly checked by anyone specifically, except when the clinician examines a patient's recordings prior to the face-to-face therapy session. As some of the questions are sensitive – 'have you thought about self-harm in the last 7 days?' 'have you self-harmed?' 'have you thought about suicide?' 'have you made any preparations to end your life?' - it is important that the patient understands that if their risk increases they

have the responsibility to seek further support, as answering 'yes' to the above questions would not trigger any new contact. Despite having this responsibility, some patients may not seek the help. However, if a patient responds yes to the "have you made any preparations to end your life?" question then this does bring up a box prompting the participant to seek help from either their GP or the Samaritans.

Conclusions

The use of an electronic real-time method of monitoring mood, thoughts of self-harm and suicidality alongside a psychological intervention seems promising, being found acceptable and useful to both patients and helpful for clinicians. While requiring evaluation on a larger scale we suggest that this could enhance aftercare of individuals who self-harm.

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Table 1 Characteristics of the 12 study participants

	N	%
Gender		
Female	10	83.3
Male	2	16.7
Age		
18-35	10	83.4
36-54	1	8.3
55+	1	8.3
Previous self-harm		
Yes	11	91.6
Method of self-harm		
Self-injury	3	25.0
Self-poisoning	9	75.0
No of sessions attended		
0	0	0
1-2	4	33.3
3-5	2	16.7
6+	6	50.0

Figure 1 Example of a patient's True Colours monitoring

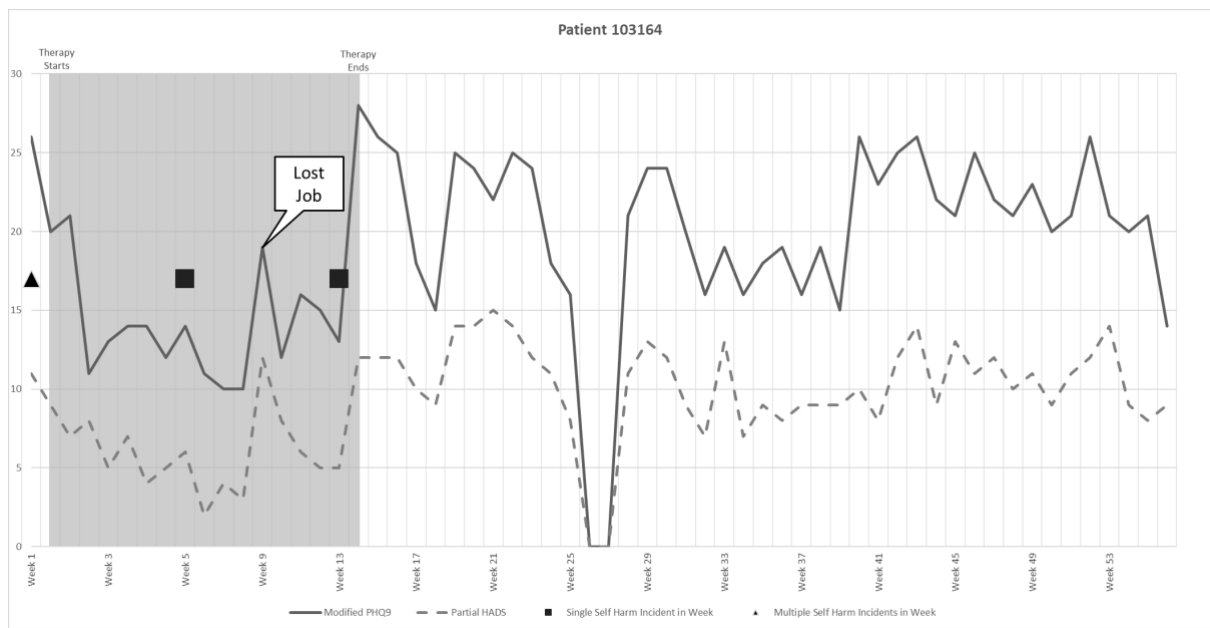
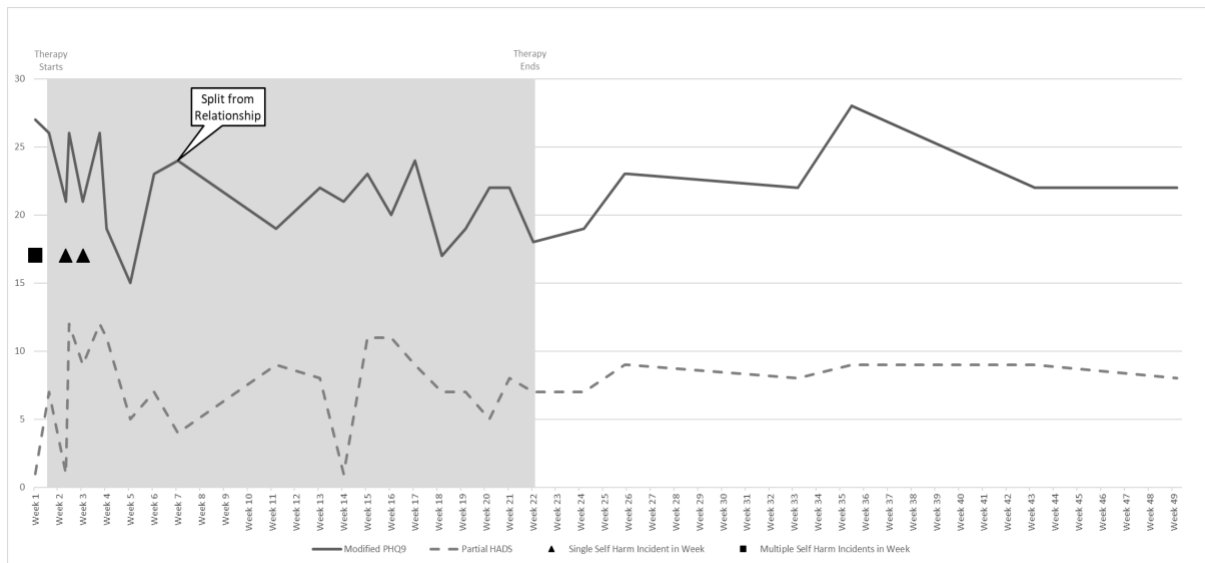


Figure 2 Example of a patient's True Colours monitoring



Appendix

Items included in the True Colours Monitoring record

PHQ - 9

Please rate these symptoms on a scale of:

- 0. Not at all
- 1. Several days
- 2. More than half the days
- 3. Nearly every day

Over the last 2 weeks have you been bothered by any of the following:

- 1. Poor appetite or overeating
- 2. Little interest or pleasure in doing things
- 3. Feeling down, depressed, or hopeless
- 4. Trouble falling or staying asleep, or sleeping too much
- 5. Feeling tired, or having little energy
- 6. Feeling bad about yourself - or that you are a failure or have let yourself or your family down
- 7. Trouble concentrating on things, such as reading the newspaper or watching television
- 8. Moving or speaking so slowly that other people could have noticed. Or the opposite - being so fidgety or restless that you have been moving around a lot more than usual
- 9. Thoughts of harming yourself in any way?

10. If you have thought of harming yourself, have you:

Actually harmed yourself?

YES

NO

11. If you have harmed yourself in the past 2 weeks have you done this

ONCE MORE THAN ONCE

12. Thoughts of ending your life?	YES	NO
13. Made preparations to end your life?	YES	NO

HADS (positive symptoms of anxiety)

Please rate these symptoms on a scale of:

- 0. Not at all
- 1. Sometimes
- 2. Very often
- 3. Nearly all the time

Over the last 2 weeks have you been bothered by any of the following:

- 1. Feeling restless as if you have to be on the move
- 2. Feeling tense or wound up
- 3. Frightened, feeling as if something bad is going to happen
- 4. Worrying thoughts going through your mind
- 5. Frightened feeling like butterflies in your stomach

Items included in the patients' feedback form

1. How easy did you find completing the weekly ratings?

Very easy

Very difficult

1 2 3 4 5

2. Was it useful to you completing your weekly ratings?

Very useful
useful

Not at all

1 2 3 4 5

3. Was useful being abler to look back over your ratings?

Very useful
useful

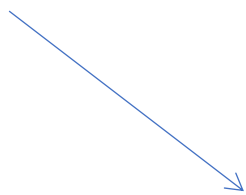
Not at all

1 2 3 4 5

4. Have you experienced any problems completing your weekly ratings?

Yes

No



Please tell us about this?

5. Would you recommend this rating system to others in a similar situation?

Yes

No

6. Anything else that you would like to say about the rating system?

Items included in the clinicians' feedback form

How easy did you find recruiting to the True Colours Pilot? (1 easy, 5 hard)

1 2 3 4 5

How easy did you find explaining the benefits of True Colours to participants?

1 2 3 4 5

Did you use the True colours information in the clinical intervention (BIRSH)

Yes/no

If yes, was it useful?

Yes/No

If yes, in what way?

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