

Impact case study (REF3)

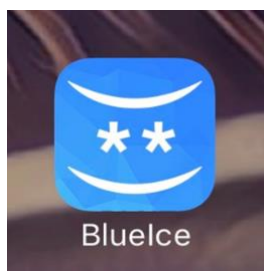
Institution: University of Bath		
Unit of Assessment: A4 Psychology, Psychiatry and Neuroscience		
Title of case study: The development and evaluation of a self-help app (BlueIce) to prevent adolescent self-harm		
Period when the underpinning research was undertaken: 2012 – present		
Details of staff conducting the underpinning research from the submitting unit:		
Name(s):	Role(s) (e.g. job title):	Period(s) employed by submitting HEI:
Paul Stallard	Professor of Child and Family Mental Health, University of Bath / Consultant Clinical Psychologist (Category C in UoA)	2005 - 2018
	Professor	March 2018 - present
Rhiannon Phillips	Senior Research Fellow	November 2008 – May 2012
Rebecca Grist	Research Assistant	March 2016 – October 2017
Period when the claimed impact occurred: February 2017 to 2020		
Is this case study continued from a case study submitted in 2014? No		
1. Summary of the impact		
<p>Research at University of Bath has improved the prevention and treatment of adolescent self-harm through the creation of the first self-help prevention app designed specifically for high risk young people (aged 12 - 17) who self-harm.</p> <ul style="list-style-type: none"> • The BlueIce app is endorsed on the NHS app library. It is prescribed by 18 Child and Adolescent Mental Health Services across the UK and is used by 2,520 young people. • Benefits to users are measurable. 73% of young people report reduced self-harm, equivalent to a reduction of 10 episodes per user over a 12-week period. • Improvements in the trial sample alone saved the NHS an estimated GBP69,923; national roll-out would save the NHS an estimated GBP1,700,000 per year. 		
2. Underpinning		
<p>Self-harm is intentional self-poisoning or self-injury, irrespective of type, motive or the extent of suicidal intent. Adolescent self-harm is alarmingly common with our school survey of young people aged 12 - 16 (G4) finding that 15% reported acts of self-harm over the past 12 months (R6). Whilst adolescent self-harm is increasing (Moran et al, 2017) effective interventions are limited. A recent Cochrane Review concluded that “<i>there is not much evidence on which to draw conclusions on the effects of interventions for self-harm in this population</i>” (Cochrane Review 2015, p 44) recommending that new therapeutic interventions should be developed in collaboration with patients to ensure that they meet their needs.</p> <p>Digital technology offers a way of increasing access to care and improving health outcomes. Adolescents are familiar with, and frequent users of, technology. In 2017 we undertook a survey of adolescent girls (G3) which showed that 97% regularly used</p>		

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smartphone apps (R4). We convened focus groups with young people with a lived experience of self-harm and found that they positively endorsed the idea of a smartphone app as a way of delivering a self-help intervention.

A systematic review (G3) was undertaken in 2017 to determine what was currently available for young people (under 18) with mental health problems (R5). Our review identified 15 apps developed specifically for young people, of which only 2 had been subject to any evaluation and none had been developed for young people who self-harm.

University of Bath led a novel co-design process with young people with a lived experience of self-harm adopting a user-centred, agile development process to create, refine, and evaluate Blueelce. This involved an ongoing collaboration between academics (University of Bath), product users (young people), NHS clinical staff (Oxford Health NHS Foundation Trust), and app developers (MyOxygen).



We started to develop Blueelce in 2016, an app that provides a personalized toolbox of strategies based on evidence-based interventions (Cognitive Behaviour Therapy and Dialectical Behaviour Therapy) that can be accessed 24 hours 7 days a week (R3). It includes a mood diary, menu of personalized mood-lifting activities, and automatic routing through safety checks to delay or prevent self-harm. Mood-lifting activities include a personalized music library of uplifting music, photo library of positive memories, physical activities, mood-changing activities, audio-taped relaxation and mindfulness exercises, identification and challenging of negative thoughts, a contact list of key people to call or text, and distress tolerance activities (informed by DBT). After using the mood-lifting section, the young person re-rates their mood, and if the urge to self-harm has not reduced, they are automatically routed to emergency numbers (nominated contact, Childline, 111) they can call.

Given the absence of evidence to suggest that mental health apps could be helpful we undertook an initial evaluation of Blueelce (G1 & G2) with 44 young people aged 12 - 17 attending specialist mental health services (CAMHS) who were self-harming (R3). Published in 2018, we found that Blueelce was safe, acceptable, easy to use and accessible (R2). Reductions in self-harm were reported by 73% of young people after using Blueelce for 12 weeks and there were significant reductions on symptoms of anxiety and depression (R1).

3. References to the research

[R1] Stallard, P, Porter, J & Grist, R 2018, 'A smartphone app (Blueelce) for young people who self-harm: open phase 1 pre-post trial', *Journal of Medical Internet Research*, vol. 6, no. 1, e32. <https://doi.org/10.2196/mhealth.8917>

[R2] Grist, R, Porter, J & Stallard, P 2018, 'Acceptability, Use, and Safety of a Mobile Phone App (Blueelce) for Young People Who Self-Harm: Qualitative Study of Service Users' Experience', *Journal of Medical Internet Research*, vol. 5, no. 1, e16. <https://doi.org/10.2196/mental.8779>

[R3] Stallard, P, Porter, J & Grist, R 2016, 'Safety, acceptability and use of a smartphone application, Blueelce, for young people who self-harm: protocol for an open Phase 1 trial.' *Journal of Medical Internet Research*, vol. 5, no. 4, pp. e217. <https://doi.org/10.2196/resprot.6525>

[R4] Grist, R, Cliffe, B, Denne, M, Croker, A & Stallard, P 2018, 'An online survey of young adolescent girls' use of the internet and smartphone apps for mental health support', *BJPsych Open*, vol. 4, no. 4, pp. 302-306. <https://doi.org/10.1192/bjo.2018.43>

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[R5] Grist, R, Porter, J & Stallard, P 2017, 'Mental health mobile apps for preadolescents and adolescents: A systematic review.', *Journal of Medical Internet Research*, vol. 19, no. 5, e176. <https://doi.org/10.2196/jmir.7332>

[R6] Stallard, P, Spears, M, Montgomery, AA, Phillips, R & Sayal, K 2013, 'Self-harm in young adolescents (12–16 years): Onset and short-term continuation in a community sample', *BMC Psychiatry*, vol. 13, 328. <https://doi.org/10.1186/1471-244X-13-328>

Grants

G1. **Stallard, P.** BlueIce a smartphone app for young people who self-harm: ensuring quality. National Health Service England. March 2017 - March 2018. Grant awarded GBP66,423

G2. **Stallard P.** Facilitating the adoption of a digital intervention for young people who self-harm (BlueIce). Health Foundation small scale spread award. Nov 2016 - Dec 2017. Grant awarded GBP31,649

G3. **Stallard P,** Woodhouse W, Scully P, Maguire M. An evaluation of an innovative telephone app (BlueIce) for young people (aged 11 - 17) who self-harm. Health Foundation Innovating for Improvement. Nov 2015 - October 2016. Grant Awarded GBP74,164

G4. **Stallard P,** R. Araya, G. Lewis, K. Sayal, A. Montgomery, R. Anderson, P. Shoebridge, W. Woodhouse, R. Stevens. & M. Moldavsky. A single blind randomized controlled trial to determine the effectiveness of group cognitive behaviour therapy (CBT) in the prevention of depression in high risk adolescents. NIHR HTA. (6 March 2004). January 2008 - March 2011. Research Grant Awarded: GBP1,029,065

G5. **Stallard P,** Taylor G, Rhodes S, Medina-Lara A & Welsh G. A comparison of usual care versus usual care plus a smartphone self-harm prevention app (BlueIce) in young adolescents aged 12 - 17 who self-harm. National Institute of Health Research, Research for Patient Benefit (NIHR RfPB). September 2019 for 30 months. Grant awarded GBP350,000.

4. Details of the impact

Professor Stallard's research has improved the mental health treatment for high risk young people who self-harm. The BlueIce research programme has produced a much needed novel, digital, self-help intervention for young people with mental health problems who engage in repeated and serious self-harm. BlueIce is being widely used (intervention adoption) and has demonstrated measurable reductions in self-harm (improved mental health) and estimated cost savings to the NHS (financial savings). Impacts available from 2017 are summarised below.

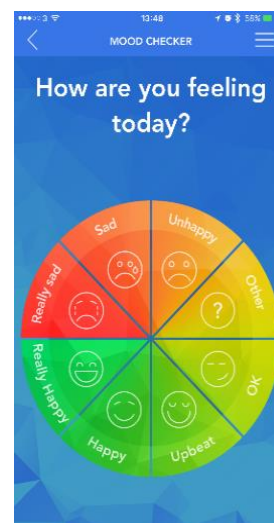
(a) **Intervention adoption:** BlueIce has attracted much local and national publicity including news stories on the ITV, Guardian and BBC (A, B, C). It is the only self-harm prevention app for children and young people recommended in the NHS Health Education England 2018 self-harm and suicide competence framework of good clinical practice (D). It is one of only 20 mental health apps/digital services to meet the rigorous standards for national endorsement on the NHS app library (E). BlueIce won the Innovation in Digital Health Award at the 2019 National Positive Practice in Mental Health Awards (F) and was highlighted as outstanding practice by the Care Quality Commission in a recent inspection (G). BlueIce is now available to child and adolescent mental health services (CAMHS) across the UK and has been prescribed by CAMHS across Bath and North East Somerset, Buckinghamshire, Cambridgeshire, East London, Wigan, Bolton, Salford, Manchester, Trafford, Bury, Heywood, Oldham, Tameside, Stockport, Oxfordshire, Swindon, Peterborough and Wiltshire to 2,520 young people with serious, repeated self-harm. Our

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aim is to make Bluelce available to all CAMHS in the UK and to extend access to young adults who self-harm.

A collaboration with colleagues at the Murdoch Children's Research Institute, Melbourne, Australia (H) has resulted in Bluelce being made available via the Australian App Store (I) where it has now been downloaded on 2,760 occasions.

(b) **Improved adolescent mental health:** Our initial work showed that after using Bluelce for 12 weeks, 73% of young people reported that their self-harm had reduced by an average of 10 episodes per person (R1). There were significant post-use reductions on standardised measures of depression (Mood and Feelings Questionnaire: mean difference =4.91; $t_{31}=2.11$; $p=.04$; 95% CI 0.17-9.64) and anxiety (Revised Child Anxiety and Depression Scale: mean difference=13.53; $t_{30}=3.76$; $p=.001$; 95% CI 6.17-20.90) (R1). The independent feasibility study in Australia found that young people felt more able to manage suicidal thoughts and feelings after using Bluelce for 6 weeks (H). Young people involved in our current randomised controlled trial in the UK rate Bluelce highly (G5). Average ratings were 9.6/10 for ease of use, 7.1/10 for helpfulness, 8.0/10 would recommend Bluelce to a friend with an overall app rating of 4.1/5 stars.



For some young people Bluelce has resulted in life-changing improvements:

"If CAMHS had given me that app around 3 or 4 years ago I wouldn't be cutting now" (J).

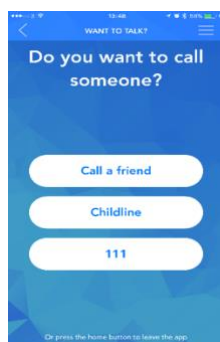
"I used to harm myself pretty much every day I think there were only a couple of days when I wouldn't. Since having the app I'm like clean, I haven't done anything" (J).

Parents also observed improvements:

"...it may not change the situation she's struggling with, but it changes her and it's a positive change, I don't mean she's bouncing round happy but more stable I guess is what I'm trying to say and it's, it's amazing" (J).

Finally, CAMHS professionals' noted benefits:

"All 'my girls' (patients) are finding the app very helpful! From my point of view, the self-harming incidents are much less frequent for those using the app" (J).



(c) **Financial savings. Study participants:** Over the course of our study Bluelce prevented 295 episodes of self-harm in 28 young people (average of 10.5 episodes per person) (J). Because most adolescent self-harm does not result in Emergency Department treatment we modelled potential cost savings based on different assumptions (described in our Health Foundation Report p15-17 (J)). We estimated the cost of an Emergency Department attendance following self-harm at GBP362 and conservatively assumed that 1 in 100 of the episodes of self-harm that Bluelce prevented would have required hospital treatment. Modelling this to the 2,520 young people in the UK for who

Bluelce has now been made available suggests a total saving to the NHS so far of at least GBP69,923. **Potential future savings:** The Local Government Association (2018) reported that 19,000 children attended hospital following self-harm in 2015. If Bluelce was available to all these children, taken up by half and prevented 50% of these episodes, the NHS would

save GBP1,700,000 per year from reduced emergency department attendances.

Whilst the potential financial savings to the NHS are significant it is the personal benefits that are of the utmost importance. As summarised by one young person:

“It’s actually really good, it has helped a lot and I haven’t self-harmed in a while. Since using the app I’ve done it once and that is over 4 weeks which is really good” (J).

5. Sources to corroborate the impact

A. ITV online news: Mental health app could help young people who self-harm (1 August 2019).

<https://www.itv.com/news/2019-08-01/mental-health-app-could-help-young-people-who-self-harm-research>

B. Guardian podcast: Treating mental health with an app. Chips with Everything podcast (18 November 2019).

<https://www.theguardian.com/technology/audio/2019/nov/18/treating-mental-health-with-an-app-chips-with-everything-podcast>

C. BBC Points West news story (11 October 2019).

D. NHS Health Education England. Self-harm and suicide prevention competence Framework, page 8 (2018). https://www.ucl.ac.uk/pals/sites/pals/files/self-harm_and_suicide_prevention_competence_framework_-_service_user_and_carer_8th_oct_18.pdf

E. Blueice on the NHS app library (accessed 18 January 2021). <https://www.nhs.uk/apps-library/blueice/>

F. Mental Health Positive Practice Award, Digital Health (2019).

G. Care Quality Commission inspection of Oxford Health NHS Foundation Trust (page 31) (13 December 2019). <https://api.cqc.org.uk/public/v1/reports/7e4c741f-9aa4-4b27-84a8-15188291577a?20191212113009>

H. The feasibility of using smartphone apps to manage self-harm and suicidal acts in adolescents admitted to an inpatient mental health ward (26 November 2020). <https://doi.org/10.1177/2055207620975315>

I. Blueice on the Australian App Store (accessed 18 January 2021). <https://apps.apple.com/au/app/blueice-au-deter-self-harm/id1458593605>

J. Health Foundation. Innovating for Improvement: An evaluation of an innovative telephone app (Blueice) for young people (aged 11-17) who self-harm (February 2017). https://www.health.org.uk/sites/default/files/9.%20Oxford%20Health_Blueice.pdf