All that glisters is not gold: reflections on Falconer et al.

Roz Shafran & Sophie Bennett

UCL Great Ormond Street Institute of Child Health

Address for correspondence: UCL Great Ormond Street Institute of Child Health, 30 Guilford Street, London WC1N 1EH. Email: r.shafran@ucl.ac.uk

Abstract

Digital Health Innovations have great potential to improve access to evidence-based psychological therapies. This comprehensive review and meta-analysis sets out the current state of the field including the efficacy of the interventions for different types of mental health problems and the desirability of the interventions from the patients' perspective. It also highlights the poor methodology of much of the research and suggests important ways forward to improve the quality of the data. The importance of assessing and understanding the potential negative impact of such interventions is emphasised both in the review and the commentary, and suggestions are made to maximise the likelihood that such interventions are accessible within routine services.

Overview

There can be few parents, clinicians or young people whose personal and professional lives have not been profoundly influenced by the digital revolution. Understanding whether digital health innovations are desired and desirable for the treatment of mental health difficulties is timely and of critical importance. This systematic and meta-analytic review included 30 new RCTs that had been published in the last 3 years. This figure alone gives an indication of the pace at which the field is moving and the interest it generates. Sadly, the quantity of research appears to have been at the expense of quality, with the authors identifying numerous methodological limitations. The specific recommendations made to improve the quality are helpful and should be prioritised. However, the authors note that previous research reviews have also identified the poor quality of the research and that attempts have been made to improve quality by the development of tools such as CONSORT ehealth in 2011 (Eysenbach & CONSORT eHealth Group, 2011). Such attempts do not appear to have borne fruit which makes one wonder as to what needs to be done to ensure that the current meta-review with its constructive suggestions, including a taxonomy of DHIs, does have an impact on improving quality so that they key questions can be answered.

Personalisation

When setting the scene for the review, the authors suggest that one benefit of a digital health innovation is personalisation. To many readers this will seem counter-intuitive as such innovations are, inevitably, driven by algorithms and are automated to a greater or lesser extent. This may allow some tailoring to individual symptom profiles and responses, but whether this is true personalisation of an intervention is debatable. Can such programmes adapt to what it is like to live with a sibling with a disability, unemployed parents or bullying or some of the other common situations which can be maintaining mental health problems in children and adolescents?

The issue of personalisation and tailoring is thoughtfully discussed, with helpful explanations of the two different constructs. It is easy to see personalisation in action when buying something from the internet. For weeks after buying something online (?perhaps forever), there are adverts selling related products that might be of interest. The technology exists to extrapolate information about a person from their buying habits and much else besides. Harnessing such technology to personalise and tailor therapeutic interventions is important and it is unsurprising that people value it. Such personalisation and tailoring in therapy appears rather basic at present, for example choosing the gender of the therapist but there are multiple intriguing possibilities. Whether such personalisation and tailoring increases adherence, enjoyment, efficiency or effectiveness needs to be established.

Negative effects

The most common clinical targets for the Digital Health Interventions were largely web-delivered, module-based computerised cognitive behaviour therapy (cCBT) that followed a traditional 'sit-down' and 'sessional' approach to treatment. The authors suggest that the use of real-time mood monitoring and integration with the intervention might enhance personalisation and adherence. The potential negative impact of such mood monitoring, and the interventions themselves, is not a focus of the review. Nevertheless, there is an argument that encouraging young

people to focus inwardly on their mood on a regular basis and increased use of devices by young people might have a negative impact.

The issue of potential negative effects of DHIs is an important area for research and although used in some of the search terms relating to self-harm or harm from alcohol, the idea that psychological treatments – however delivered – can do harm as well as good must be taken into account in research going forward. Some of the potential adverse effects of using DHI in a public platform are raised in the concluding section and these cautions should be taken seriously. Similarly, there are potential adverse effects of using DHIs within clinical services in the same way as there are adverse effects of traditional interventions, and these need to be considered, monitored and addressed. It is notable that in the innovative, 'Supporting Safe Therapy' website (http://www.supportingsafetherapy.org) aimed at improving the experience of psychological therapy and preventing potential harmful effects, there is no mention of digital health interventions under types of therapy. Accepting and understanding such potential negative effects will be fundamental to any blending of DHIs with traditional therapies and incorporating them into routine clinical practice as well as making them freely available and accessible online.

'Brain Training'

It is disappointing that 'brain training' programmes that are fun and should, in theory, have a positive impact on ADHD symptoms have yet to yield fruit in terms of producing improvement. It would be useful to explore the potential reasons for this and the impact both in terms of our understanding of ADHD and also treatment developments going forward. The interventions for ASD showed more promise, including the finding that parents reported their children enjoyed playing them. Generalising from the game to real-situations is another critical step forwards and presumably technological innovations that allow virtual and real-worlds to be blended as in 'Pokeman Go' have great potential in helping apply skills into the real world.

Questions, questions, questions

Reviews such as this often aim to answer a number of questions but end up raising many more. Perhaps the most surprising question that remains concerns cost-effectiveness. Why is there so little information on the cost-effectiveness of the digital interventions? Why hasn't the health economics analysis been incorporated into recent RCTs? One of the prime arguments for digital interventions is that it allows evidence-based interventions to be 'scaled up' and increases the availability of (and access to) treatments (Fairburn & Patel, 2014). Such scalability will be limited if humans are needed for diagnosis, continued engagement and adherence to the intervention.

Additional outstanding questions regarding dose responsiveness and generalisability remain. The importance, role and qualifications of the person doing the guidance have yet to be established. The authors point out a discrepancy between the adult literature showing larger intervention effects as the amount of therapist contact increases and the research on children and young people and university students where the data are more mixed. The potential role of a 'virtual' coach raises a number of possibilities for both personalisation, increasing of access and cost effectiveness. Should such a coach be a 'therapists' or an 'educator' or are the boundaries between 'therapy' and 'education' in DHIs somewhat blurred? Are there data from effective e-learning that can be

harnessed for DHIs? Does framing such interventions as 'learning' help overcome the stigma that is associated with obtaining support for mental health? Do such packages have an impact on stigma? All of these important questions are answerable within research studies.

What is better than something?

Unsurprisingly, the effect of a digital health intervention is larger when compared with no active treatment than when compared with an active one. There are sufficient data to warrant confidence in the conclusion that 'something is better than nothing' when it comes to digital health interventions for depression and anxiety. The data regarding the relative superiority of specific active interventions have yet to be established and this also has implications for understanding the maintaining mechanisms of psychopathology and developing more efficient and effective interventions. One route that is suggested to establish the active components of an intervention is 'Multiphase Optimisation Strategy' with the wonderful acronym of 'MOST' (Collins, Nahum-Shani and Almirall, 2014) and it is innovations such as these that will hopefully yield fruit for future treatment development.

Security in real world settings

One paragraph of the paper is given to the issues concerning security and privacy. This short paragraph betrays a much larger and problematic issue with delivering such innovations in a healthcare setting such as the UK's National Health Service. Many health care providers are understandably concerned about these issues and trying to use such innovations in a routine setting can be fraught with red tape, bureaucracy and plain refusal to allow the intervention to be part of the services. There are related issues with trying to have the data collected as part of the DHI incorporated into routine service outcome monitoring and even the electronic patient records that are held within the treatment centre. Failure to ensure the DHI is compatible with such systems limits the transfer of these innovations from research and public health to clinical services.

Tell me what you want, what you really really want

Whether DHIs appeal to young people is an important question which the authors attempt to address. Intuitively, it seems as though there will be some young people for whom such innovations are of fundamental importance as they would never seek services or face to face support, and they would also never take part in any research study. These may be the 75% of people (Davies, 2014) identified from epidemiological services who are in need but have never had support. Other young people are likely to prefer face to face interaction. Factors that determine such personal preferences need to be established including gender, family support, age and personality characteristics. Identification of such factors should not detract from the merit and value of giving people a choice as to how they want their services delivered. The review identifies some of the concerns of healthcare professionals regarding DHIs and the same disconnect between research questions (which is often along the lines of: 'what is better DHI or F2F?') and clinical questions regarding blending of the two interventions to help integrate DHIs with clinical practice. Such a disconnect needs to be urgently addressed to ensure that the science-practice gap that characterises so much of clinical psychology research (Lilienfeld, Ritschel, Lynn, Cautin & Latzman, 2015) does not repeat itself in this new field.

A way forward?

The authors sound a little weary when it comes to their call for a 'taxonomy of DHIs'. It is almost as though they anticipate that such a call will not result in change and that the issues that plague this nascent field are likely to continue despite the established recognition of the problems and a sensible way forward. If funding agencies, ethics committees and journals made it mandatory for studies to adhere to eCONSORT guidelines, then this would increase adherence to such a helpful structure. Involving such organisations in creating a taxonomy would also increase the likelihood of it becoming a reality. Sadly, simply leaving it to researchers despite it being an obviously good idea and helpful way forward is unlikely to be enough. The authors note, it is only through multi-disciplinary collaborations between engineering, computer science, human factors, human computer interaction, psychology and mental health services research that the full potential of DHIs will be realised. We would suggest that it also has to come from the 'bottom up'. If some of the 75% of people hitherto untouched by psychological support despite needing it access the DHIs and publicise their benefit on social media then this will have more impact on increasing access than traditional routes of dissemination. Involving 'vloggers' in the development and dissemination of such interventions as well as young people and families who access services, school counsellors, and online communities will help ensure that such innovations have maximum positive impact now and in the future.

References

Collins, L. M., Nahum-Shani, I., & Almirall, D. (2014). Optimization of behavioral dynamic treatment regimens based on the sequential, multiple assignment, randomized trial (SMART). *Clinical Trials*, *11*(4), 426-434.

Davies, S. (2014). Annual Report of the Chief Medical Officer 2013, Public Mental Health Priorities: Investing in the Evidence. London, UK: Department of Health.

Eysenbach, G., & CONSORT eHealth Group. (2011). CONSORT-EHEALTH: Improving and Standardizing Evaluation Reports of Web-based and Mobile Health Interventions. *Journal of Medical Internet Research*, *13*(4), e126.

Fairburn, C. G., & Patel, V. (2014). The global dissemination of psychological treatments: a road map for research and practice. *American Journal of Psychiatry*, *171*(5), 495-498.

Lilienfeld, S. O., Ritschel, L. A., Lynn, S. J., Cautin, R. L., & Latzman, R. D. (2015). *Science–practice gap. The encyclopedia of clinical psychology*.