Interconnected or disconnected? Promotion of mental health and prevention of mental disorder in the digital age

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Biographies

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Summary

To date there have been few peer-reviewed studies on the feasibility, acceptability and effectiveness of digital technologies for mental health promotion and disorder prevention. Any evaluation of these evolving technologies is complicated by a lack of understanding about the specific risks and possible benefits of the many forms of internet use on mental

health. In order to adequately meet the mental health needs of today's society, psychiatry must engage in rigorous assessment of the impact of digital technologies.

Background

The internet has made rapid and dramatic changes to society. It has altered the way we communicate, form groups, gather and process information, develop relationships and spend our leisure time. On average we spend one minute in every twelve of our waking life connected to the internet, and this year 25% of the world's population will use a smartphone (1). Contemporary psychiatry has failed in its duty to keep pace with these changes.

There is an insufficient evidence base to reliably appraise the internet in terms of specific harms and benefits to mental health and this limits our understanding of the potential for using it for mental health promotion and secondary or tertiary prevention. Here we describe the available evidence, discuss what can be learnt from other areas of health promotion research, and make recommendations for further research.

Digital mental health promotion

Research in mental health promotion has tended to focus on issues such as reducing stigma, reviewing lifestyle factors, enhancing socialisation and improving mental health awareness using non-digital approaches (2). These key components of mental health promotion need to be transposed to, and adapted for digital media. Similarly studies of the lived environment, which continue to concentrate on access to green space, good quality housing and face-to-face contact (14) must begin to examine the possible impact of virtual worlds: Facebook friends, Twitter retweets and Instagram likes.

A systematic search of one database (Medline) using appropriate MeSH headings and keywords (*psychiatry* or *mental health* or *mental disorder*, and *health promotion*, and *digital* or *internet* or *software* or *computer communications network* or *online systems* or *computers*) reveals the paucity of evaluation in this area. Electronic cognitive behavioral (eCBT) interventions have been more widely appraised and are excluded here (although some of these may have components of secondary or tertiary health promotion imbedded within them). Of 258 articles published before the end of March 2015 only 32 studies evaluated novel digital interventions, and only 9 of these used randomised controlled methods. Of these trials, 5 had outcomes relating to mental-wellbeing (3-7), 3 measured knowledge of and reduction in drug and alcohol use (8-10), and 1 reported healthy eating outcomes in eating disorders (11). Other articles identified in the search explored how individuals access mental health information and advice. Many articles focused on specific subgroups, particularly younger people.

Two systematic reviews have investigated the effectiveness of internet-based programs and specially designed software packages to achieve behaviour change in areas such as sexual health, smoking cessation and healthy eating, which could be considered within the wider remit of mental health promotion (12, 13). These reviews demonstrate the potential for the internet to be used as a tool for engagement with traditionally hard to reach groups, especially younger, minority groups who experience stigma. The target audience for mental health promotion, and secondary and tertiary prevention, shares some of these characteristics and it may be possible to extrapolate from these findings. In these areas, some of the key elements of digital technologies have been positively appraised: effectiveness, cost-benefit, ability to provide standardised information in a tailored manner, interactivity, privacy, autonomy, and

portability (14). Recent reviews have also summarised evidence for eCBT in secondary prevention (15) and electronic games as a method of delivering therapy (16). Although these digital approaches are popular among certain subgroups, with high acceptability ratings, there is still a need to rigorously test digital interventions against 'real world' outcomes.

Potential harms of internet use

To fully appreciate the potential for digital health promotion we need to more comprehensively understand the harms and benefits of internet use, particularly if this usage differentially impacts on subgroups. The press has speculated that certain aspects of the internet may be directly detrimental to mental health (17), but good quality research in this area is sparse.

Some 'real world' risk factors for poor mental health exist in a concentrated form on the internet. Pro-anorexia websites are postulated to be more harmful than traditional media because they include both extreme pro-anorexia content and peer encoragement (18). Similarly pro-suicide and self-harm websites provide discussion boards and information about high-risk methods that might have previously been inaccessible. Studies of people with histories of offline victimisation show that these individuals are at increased risk of online bullying and sexual solicitation (13). Online gaming, gambling, pornography and generalised high volume use have all been identified as risk factors for poor mental health (19, 20).

A particular area of concern is the lack of clarity over the impact that online relationships have on socialisation. We know that social isolation is a predictor of poor mental health and that belonging to multiple social groups can be protective against the potential mental health effects of significant life events, such as bereavement or physical health problems (21).

However, it remains unclear whether sites like Facebook augment or replace offline social networks. The ease of joining or leaving many online groups and the transitional nature of social network sites would suggest that they might provide less reliable support. Conversely social networking sites could provide support for those who find it hard to form or sustain offline relationships, offering an opportunity to communicate with individuals with similar lived experiences, regardless of geographical proximity. Age may be an important mediating factor when addressing questions such as this, as some studies suggest that *digital natives* (those born after digital technologies became commonplace) are more likely to find the internet pro-social (22).

The internet allows individuals to access vast amounts of information about mental health without clear indications of provenance or quality. This access to information can fuel medicalisation and healthism; potentially pathologising the problems of everyday life. This is a common criticism of strategies for health promotion that focus on an individual's responsibility for self-management of their health (23). Access to (mis)information can also complicate secondary and tertiary prevention, and doctors may need to learn to confront this explicitly in the consultation.

Putative benefits of internet use

Despite the concerns discussed, it is likely that the internet has many potential benefits which could be harnessed for mental health promotion and illness prevention. As a tool for individual empowerment it can educate, reduce stigma, signpost resources, access hard to reach groups, provide fora for patient and carer support groups, and potentially encourage more emotional expression and self-reflection (24).

The Royal College of Psychiatrists website provides detailed information for patients about mental health conditions, and has an online learning module on "effective use of the internet". This covers some of the broad impacts the internet could have on mental health (25). It has also issued guidance for clinicians that young people should be asked about their online lives during assessments following self-harm, and that they should be directed towards recovery orientated websites (26). Whilst we welcome this advice, we feel that it does not go far enough and that all mental health assessments require engagement with an individual's "online life history". Other professional bodies appear to lag behind in their understanding of how digital technologies have integrated into daily life. For example NHS online, as its first step towards mental wellbeing, encourages people to "*connect*" suggesting we should "*switch off the TV tonight and play a game with the children, or just talk*" (27) With more people watching television programs online, playing multiplayer online games and talking via webcam, this advice, and the evidence on which it is based, is already outdated.

Implications for future research and practice

There is a need to quantify the impact of the internet on mental health and to begin formulating approaches to mental health promotion that are relevant to the digital age. We need to measure the digital usage and fluency of at risk groups, levels of digital inequality, and the associations between specific mental health conditions and internet and social media use. Research is also needed into the effectiveness of online information seeking, the use of online peer support groups and the acceptability of digital applications in engaging with target populations. Following this, the effectiveness of targeted or population-wide interventions can be considered. As discussed, these interventions are likely to include modified versions of traditional health promotion approaches, eCBT and other electronic therapies, electronic games, online peer-support networks and user groups. As the scope and

the manner in which digital technologies are used changes very rapidly, reviews in this area need to be regularly updated to remain relevant to researchers, clinicians, patients and the public.

Conclusions

Digital technologies have radically reshaped daily life. With its focus on both the scientific and humanistic, psychiatry is unique in medicine because of the extent to which it has been, and will continue to be, affected by the internet and social media. However, it is also uniquely placed to capitalise on these opportunities. The strength of the internet as a social tool may enhance its effectiveness beyond a simple delivery method for health promotion information. In order to ensure relevant mental health promotion is provided to an increasingly digital society, more evaluation of the effects of digital technology are needed in research and clinical practice.

References

1. http://www.emarketer.com/Article/Smartphone-Users-Worldwide-Will-Total-175-Billion-2014/1010536 accessed 22 April 2015

2. Kalra G, Christodoulou G, Jenkins R, Tsipas V, Christodoulou N, Lecic-Tosevski D, et al. Mental health promotion: guidance and strategies. Eur Psychiatry. 2012; 27(2): 81-6.

3. Powell J, Hamborg T, Stallard N, Burls A, McSorley J, Bennett K, et al. Effectiveness of a web-based cognitive-behavioral tool to improve mental well-being in the general population: randomized controlled trial. J Med Internet Res. 2013; 15(1): e2.

4. Morgan AJ, Jorm AF, Mackinnon AJ. Protocol for a randomised controlled trial investigating self-help email messages for sub-threshold depression: the Mood Memos study. Trials. 2011; 12: 11.

5. Bannink R, Broeren S, Joosten-van Zwanenburg E, van As E, van de Looij-Jansen P, Raat H. Effectiveness of a Web-based tailored intervention (E-health4Uth) and consultation to promote adolescents' health: randomized controlled trial. J Med Internet Res. 2014; 16(5): e143.

6. Billings DW, Cook RF, Hendrickson A, Dove DC. A web-based approach to managing stress and mood disorders in the workforce. J Occup Environ Med. 2008; 50(8): 960-8.

7. Ebert DD, Hannig W, Tarnowski T, Sieland B, Gotzky B, Berking M. [Web-based rehabilitation aftercare following inpatient psychosomatic treatment]. Rehabilitation (Stuttg). 2013; 52(3): 164-72.

8. Cunningham JA. Comparison of two internet-based interventions for problem drinkers: randomized controlled trial. J Med Internet Res. 2012; 14(4): e107.

9.   Ondersma SJ, Svikis DS, Schuster CR. Computer-based brief intervention a randomized trial with postpartum women. Am J Prev Med. 2007; 32(3): 231-8.

10.   Vogl L, Teesson M, Andrews G, Bird K, Steadman B, Dillon P. A computerized harm minimization prevention program for alcohol misuse and related harms: randomized controlled trial. Addiction. 2009; 104(4): 564-75.

11.   Leung SF, Ma LC, Russell J. An open trial of self-help behaviours of clients with eating disorders in an online programme. J Adv Nurs. 2013; 69(1): 66-76.

12.   Portnoy DB, Scott-Sheldon LAJ, Johnson BT, Carey MP. Computer-delivered interventions for health promotion and behavioral risk reduction: A meta-analysis of 75 randomized controlled trials, 1988–2007. Preventive Medicine. 2008; 47(1): 3-16.

13.   Webb T, Joseph J, Yardley L, Michie S. Using the internet to promote health behavior change: a systematic review and meta-analysis of the impact of theoretical basis, use of behavior change techniques, and mode of delivery on efficacy. Journal of medical Internet research. 2010; 12(1): e4.

14.   Allison S, Bauermeister JA, Bull S, Lightfoot M, Mustanski B, Shegog R, et al. The intersection of youth, technology, and new media with sexual health: moving the research agenda forward. J Adolesc Health. 2012;51(3):207-12.

15.   Musiat P, Tarrier N. Collateral outcomes in e-mental health: a systematic review of the evidence for added benefits of computerized cognitive behavior therapy interventions for mental health. Psychol med. 2014; 44(15), 3137-3150.

16.   Horne-Moyer, HL, Moyer BH, Messer DC, Messer ES. The Use of Electronic Games in Therapy: a Review with Clinical Implications. Current psychiatry reports. 2014; 16(12), 1-9.

17.   Swain F. Susan Greenfield: Living online is changing our brains. New Scientist. 2011; 3.

18.   Juarez L, Soto E, Pritchard ME. Drive for muscularity and drive for thinness: The impact of pro-anorexia websites. Eat disord. 2012; 20(2): 99-112.

19.   Frangos CC, Frangos CC, Sotiropoulos I. Problematic internet use among Greek university students: an ordinal logistic regression with risk factors of negative psychological beliefs, pornographic sites, and online games. Cyberpsychol Behav Soc Netw. 2011; 14(1-2): 51-8.

20.   Kraut R, Patterson M, Lundmark V, Kiesler S, Mukophadhyay T, Scherlis W. Internet paradox: A social technology that reduces social involvement and psychological well-being? American psychologist. 1998; 53(9): 1017.

21.   Wills TA, Ainette MG. 20 Social Networks and Social Support. Handbook of health psychology. 2012: 465.

22.   Huang C. Internet use and psychological well-being: A meta-analysis. Cyberpsychol Behav Soc Netw. 2010; 13(3): 241-9.

23.   Korp P. Health on the Internet: implications for health promotion. Health Educ Res. 2006; 21(1):78-86.

24.   Barak A, Grohol JM. Current and future trends in Internet-supported mental health interventions. Journal of Technology in Human Services. 2011;29(3):155-96.

25.   Royal College of Psychiatrists. Effective use of the internet. Online CPD http://www.psychiatrycpd.co.uk/learningmodules/effectiveuseoftheinternetinernet.aspx accessed 22 April 2014

26.   Royal college of psychiatrists. Managing self-harm in young people. Royal College of Psychiatrists, 2014 College Report:192.

27.   NHS Choices. Connect for mental wellbeing - Stress, anxiety and depression - http://www.nhs.uk/Conditions/stress-anxiety-depression/Pages/connect-for-mental-wellbeing.aspx. accessed 22 April 2014