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Clifton, A., Goodhall, D., Ban, S. and Birks, S. (2013) 'New perspectives on the contribution of digital technology and social media use to improve the mental wellbeing of children and young people: A state of the art review.' *Neonatal Paediatric & Child Health* ISSN 1441-6638

Keywords

Digital technology, social media, children and young people, mental health,

Introduction

Young people account for 27% of the world's population¹ and in any given year 20% of adolescents will experience a mental health problem, most notably anxiety or depression, however, this risk is increased by experiences of violence, humiliation, devaluation and poverty.² Despite progress in identifying risk factors and effective interventions for treating mental illness in young people a lacuna remains in how to prevent mental illness and promote positive mental health outcomes.³ The World Health Organization (WHO)² highlights the importance of building life skills and providing psychological support in schools and other community settings for children and adolescents. In addition WHO² have produced a document for policy makers, decision makers and programme managers in both developed and developing countries to improve the quality and 'friendliness' of health services for young people. A central feature of the document is the 'critical role' individual young people can make to their own health and well being.⁴ Therefore, the identification, assessment, and treatment of young people is a multi-disciplinary endeavour dependent on the cultural, political and economic factors of the associated region, nation state or community.

One emerging paradigm that may have the potential to add to the identification, prevention and treatment of young people with mental health problems is the increasing use of digital technologies, including the internet and social media. The latest data from December 2011 indicates there are 2.2 billion (32.7% of the global population) internet users, a 528% growth rate since 2000. The growth in some regions such as Africa (2,988%), the Middle East (2,244%) and Latin America/Caribbean (1,205%) is even more impressive⁵ and, according to Chan & Fang⁶, new communication technologies will have a more significant impact on the lives of young people than other past technological innovations. Access to digital technologies among children and young people is dependent on a number of factors including age, gender, and socio-economic status and while it is acknowledged there is a vast digital divide⁷ among children and young people in both developed and developing countries, undoubtedly there is an opportunity to utilise digital technologies to promote and improve the mental wellbeing of children and young people. Despite these perceived opportunities Seylwn⁸ offers a note of caution against popular assumptions that young people are intuitively expert users of digital technologies. Added to this caveat are potential safety issues, such as harassment, that may occur when children and young people access online resources.⁹

Patel³ highlights the problem of categorising childhood and adolescence in different cultures globally. A cut off from childhood status may occur in some cultures when a child becomes able to contribute socially or economically to their family. For example a child of 6 years of

age who begins working is no longer considered to be in childhood. Adolescence is similarly difficult to compartmentalise depending on context and culture with this stage ranging in ages from 12-24 years.³ In addition to the difficulties in defining the age spectrum there is the added complexity of the possible non linear aspect of child development dependent on environment.

Piaget's concepts of cognitive psychology and cognitive development provide insights into emotional development in childhood highlighting how children's thinking differs from adult thinking.¹⁰ Adolescents possess a variation in coping levels – some recover better than others from stressful life events. Encouraging resilience is thought to be preferable to reacting after an event. Emotion focused strategies, used for managing feelings, are used more frequently as the child grows into adolescence and problem focused strategies are not thought to be related to age at all.¹¹ It is important to acknowledge that these categories are socially constructed, when developing treatment modalities and innovative interventions to enhance the mental wellbeing of children and young people.

Aims and objectives or purpose

The purpose of this paper is to identify the extent, if any, that digital technology can impact on the mental well being of children and young people, to determine some implications for practice, and to highlight any risks and/or barriers that may impede the use of such technology.

Methods

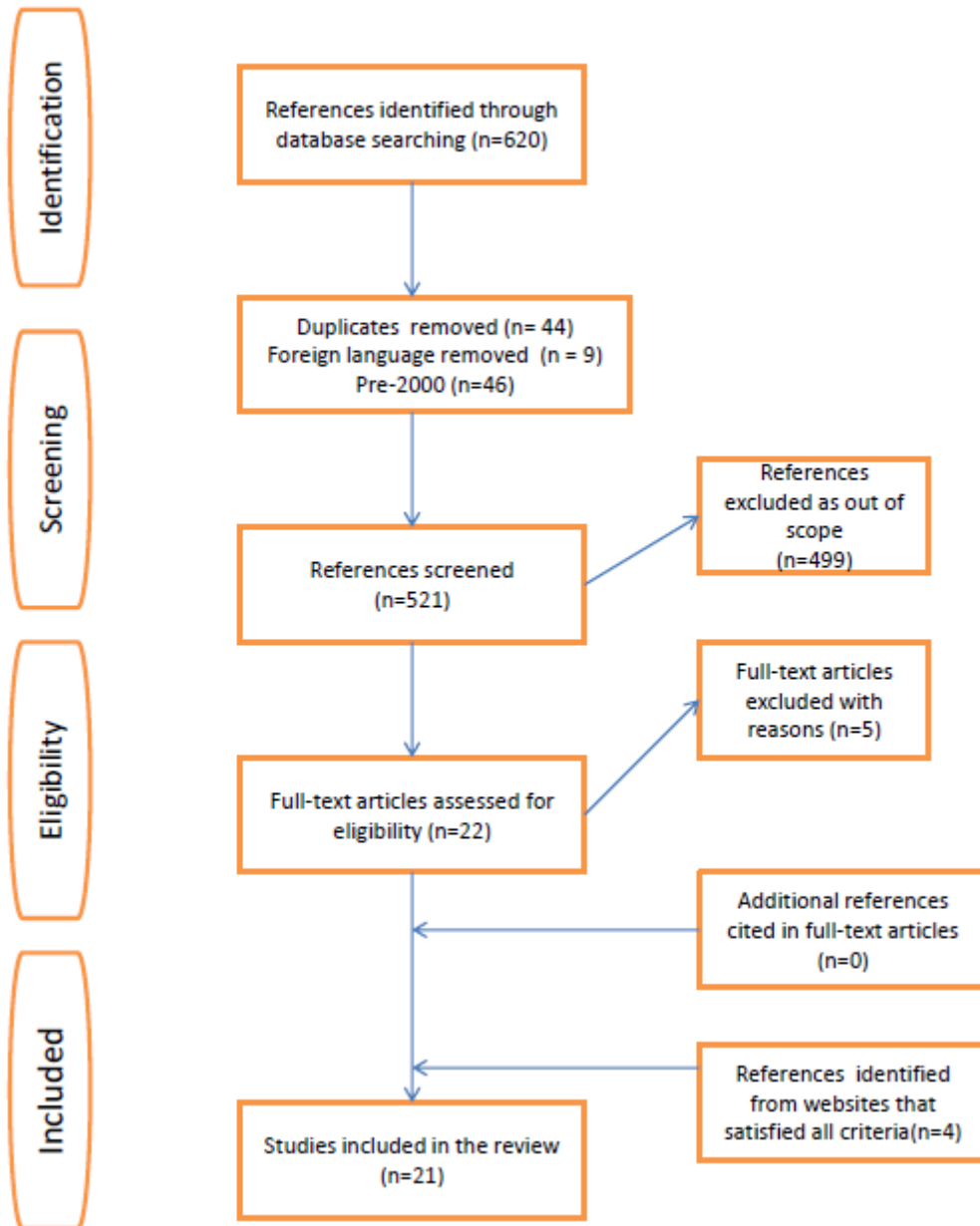
Approach: Synthesising evidence, by bringing together a range of individual qualitative and quantitative research reports that have a shared focus, can provide a fresh insight into a topic and lead to conceptual development. This study uses a 'state of the art' literature review methodology to achieve this aim. The strength of such a literature review lies in its ability to address more current matters in contrast to other combined retrospective and current approaches, and as such it may offer new perspectives on issue or point out areas for further research.¹² As with, for example, a systematic review, the research question is identified, relevant studies are found through comprehensive searching of current literature and considered for inclusion/exclusion. However at this point there is no formal quality assessment; selection criteria are not based on the quality of the studies but on relevance to the topic. All of the included studies are tabulated to some extent and themes and key issues identified and narrated through the lens of the state of the art review. The concluding analysis reflects the current state of knowledge and identifies priorities for future investigation and research.

Identification of relevant studies: Structured searches for 1980-2012 were conducted in three major subscription bibliographical databases, (Web of Knowledge, CINAHL and Proquest Nursing and Allied Health Source) during March 2012 by an Information Specialist (DG) working in partnership with the research team (AC, SB, EB) to identify English-language articles in press or published in peer-review academic journals. The following search terms and variants were applied: (child* OR "young people" OR "young adult*" OR adolescen* OR teenage* OR paediatric*) AND (mental health) AND (issue* OR problem* OR illness* OR risk* OR condition* OR difficult*) AND ("social media" OR "social network*" OR

internet OR computer* OR online OR "mobile technolog*" OR "information communication technolog*" OR ICT). A search of selected professional websites (MIND, NHS Evidence, NSPCC, SCIE, UNICEF, WHO) was also made in order to retrieve relevant grey or unpublished literature. This hand search identified four items that matched the screening and selection criteria. References of the full-text articles assessed for eligibility were hand-checked to identify further references that satisfied selection criteria.

Screening and selection for eligibility:

Diagram 1: Summary of identification, screening and selection process



A total of 620 references (196 from Web of Knowledge, 297 from CINAHL, 127 from Proquest Nursing and Allied Health Source) were retrieved and downloaded into an EndNote 14 Library. References dating from pre-2000 were removed. Duplicate references, foreign language items, references that referred to papers that were not in press or published in a journal (eg dissertation abstract, conference abstract etc), or did not report original research

(e.g. review papers) were excluded by DG. The remaining 521 references were screened independently at title/abstract level by DG and by AC working to the following criteria to identify items that focused on these three aspects in combination: 'young people' e.g. of school / college / university age, any mental health issue, the use of digital technology by the young people in connection with the mental health issue. 499 references did not meet these initial screening criteria and were excluded. These 'out of scope' references included topics such as the 'new' mental health problems appearing due to internet use such as cyber-bullying. Full text articles were obtained for the remaining 21 references and these were then shared between the team members (AC, SB, EB) and assessed for eligibility using a derivation of the Open University's PROMPT (**P**resentation, **R**elevance, **O**bjectivity, **M**ethod, **P**rovenance, **T**imeliness) checklist for considering evidence.¹³ We attempted to map all PROMPT categories to the studies reviewed, however, this was not always possible as each study included did not contain all categories. Five full-text articles were excluded and these are listed, together with exclusion reasons in Box 1.

Box 1: Excluded references

Reference	Reason for exclusion
Bergren MD. Information technology. Child and adolescent mental health Web resources. <i>J Sch Nurs.</i> 2002;18(4): 226-228.	Descriptive article from the USA identifies 9 mental health web resources for school nurses to assist in recognising and preventing mental health issues. Not about young people using ICT themselves for their own mental health and wellbeing.
Heiervang E, Goodman R. Advantages and limitations of web-based surveys: evidence from a child mental health survey. <i>Soc Psychiatry Psychiatr Epidemiol.</i> 2011;46(1): 69-76.	Norwegian study exploring benefits of web based assessments, and conventional (face to face) approaches for child mental health involving parents.
Rickwood DJ. Developmental patterns in using the internet to seek help for mental health problems in adolescence. <i>Aust J Psychol.</i> 2002;54: 52-52.	Abstract only.
Sik Lnyi C, Laky V et al. Developing Multimedia Software and Virtual Reality Worlds and their Use in Rehabilitation and Psychology. <i>Stud Health Technol Inform.</i> 2004; 105: 273-284.	Description of virtual education initiatives in Hungary for 'handicapped children' and adults in rehab for phobias. No information on numbers in study or ages involved.
Walsh J. V. Scaife et al. Perception of need and barriers to access: the mental health needs of young people attending a Youth Offending Team in the UK. <i>Health Soc Care Community.</i>	This study is about barriers and access to services, not social media or technology.

2011;19(4): 420-428.

The characteristics and key findings of the articles that satisfied the selection criteria and are included in the review are shown in Table 1: Summary of Findings.

Table 1: Summary of Findings

Reference	Main Findings
Borzekowski DLG. Adolescents' Use of the Internet: A Controversial Coming-of-Age Resource. <i>Adolesc Med Clin.</i> 2006;17(1): 205-16.	A discussion paper which highlights the need for young people to develop online media literacy skills to negotiate around website in relation to mental and psychiatric conditions. More research is required to determine the efficacy of online therapies and health promotion sites. Age range: young people (not specified).
Burns J M, Durkin LA et al. Mental health of young people in the United States: what role can the internet play in reducing stigma and promoting help seeking? <i>J Adolesc Health.</i> 2009;45(1): 95-97.	This paper reviews an Australian based internet-based service (Reach Out) to determine its usefulness in reducing stigma and increasing self help for young Americans. The results identify that Reach Out had increased awareness of support, conditions and how to help others in relation to their mental well being. Age range: 16-25
Chisolm D J, Gardner W et al. Adolescent Satisfaction with Computer-Assisted Behavioural Risk Screening in Primary Care. <i>Child Adolesc Ment Health.</i> 2008;13(4): 163-168.	A research study which explores the satisfaction rates of young people with a computer assisted screening tool for 'risk behaviour'. The time efficient computerised screening tool used in primary care has the potential to improve screening and in this study was perceived to be useful and easy to use. Age range: 11-20 years.
Cleary M, Walter G. Is e-mail communication a feasible method to interview young people with mental health problems? <i>J Child Adolesc Psychiatr Nurs.</i> 2011;24(3): 150-2.	Use of ICT for confidential e mail interviews highlighted in this study. It was felt that not being 'face to face', allowed for greater exploration of sensitive issues. Age range: not specified.
Devine P, Lloyd K. Internet use and psychological well-being among 10-year-old and 11-year-old children. <i>Child Care in Practice.</i> 2012;18(1), 5-22.	An annual quantitative survey documenting social issues affecting the lives of young people in Northern Ireland particularly looking at internet use and psychological well being. The KIDSCREEN-27 instrument was used to assess quality of life as reported by the child. High use of ICT was reported, and the use of social networking sites and online games related to poor psychosocial well being in girls

	<p>but not boys. Both boys and girls who experience cyber bullying had poorer psychosocial well being. Age range: 10-11years.</p>
<p>Gowen K, Deschaine M et al. Young Adults with Mental Health Conditions and Social Networking Websites: Seeking Tools to Build Community. Psychiatr Rehabil J. 2012; 35(3): 245-250.</p>	<p>This research study highlights the need for practitioners to be aware of, and safely encourage use of, different social networking sites used by young adults living with a mental health illness. Particular interest was said to be shown by that group, in websites tailored to their population with tools to decrease social isolation and aid independence. Age range: 18-24 years.</p>
<p>Gross EF, Juvonen, J, Gable, SL. Internet use and well-being in adolescence. J Soc Issues. 2002;58(1): 75-90.</p>	<p>The hypothesis that Internet use may be associated with decrease in well being in adolescence is challenged in this paper. The association between well being and social aspects of internet use is examined here, using 'dispositional measures of well being' and also logging of instant messages. The latter was associated with daily social anxiety and loneliness in school, but time spent on line was not associated with dispositional or daily well being. Age range: not specified.</p>
<p>Horgan A, Sweeney J. Young students' use of the Internet for mental health information and support. J Psychiatr Ment Health Nurs. 2010;17(2): 117-123.</p>	<p>A solution to the perceived issue of stigma by young people to accessing mental health services is addressed in this quantitative study. It suggests offering support by psychiatric nurses on the many websites available offering information on mental health issues. One third of the participants had searched the internet for information on depression and the majority would have preferred face to face support. Age range: university students.</p>
<p>Mackenzie R, Watts J. Robots social networking sites and multi-user games: using new and existing assistive technologies to promote human flourishing. Tizard Learning Disability Review. 2011; 16(5): 38-47.</p>	<p>Speculates on how future technologies, such as robotics, can enable and assist young people (and into their older age) to enhance their well being in the form of emotional companionship, communication and reducing isolation. Age range: 10 plus.</p>
<p>McBride DL. Risks and Benefits of Social Media for Children and Adolescents. J Pediatr Nurs. 2011;26(5): 498-499..</p>	<p>This editorial reviews a report by the American Academy of Paediatricians highlighting some of the risks and benefits of children and teenagers using digital technology and in particular social media sites. Age range: children and teenagers.</p>
<p>Mitchell KJ, Finkelhor D et al. Linking youth Internet and conventional problems: findings from a clinical perspective. J</p>	<p>Study looked at linking youth internet and conventional problems from a professional perspective. Cluster analysis identified 'on line victimisation', 'inappropriate sexual behaviour', 'online isolation' and 'online/offline</p>

<p>Aggress Maltreat Trauma. 2007;15(2): 39-58.</p>	<p>problems'. Problematic internet experiences are often behaviours clinicians were already working with prior to the advent of the internet, but there was increased severity and frequency of problems requiring 'unique responses'. Age range: 5 plus</p>
<p>Murie J, Dickson, A. Think positive: a mental health promotion website for 12-18 year olds. International Journal of Mental Health Promotion. 2002;4(1): 26-33.</p>	<p>This paper describes the development of a mental health promotion website. Its place in clinical practice is dependent on whether its information is accurate and access is secure. Guidelines are recommended. Age range: 12-18 years.</p>
<p>Nicholas J. The role of internet technology and social branding in improving the mental health and wellbeing of young people. Perspect Public Health. 2010;130(2): 86-90.</p>	<p>One in three Australians have used the website Reach Out! Since 1998. This case study concluded it can serve as a model for the social sector to use ICT to promote mental health and well being of young people. Age range: not specified.</p>
<p>Oh E, Jorm AF et al. Perceived helpfulness of websites for mental health information. Soc Psychiatry Psychiatr Epidemiol. 2009;44(4): 293-299.</p>	<p>This research study involved telephone interviews to compare young people's preferences for mental health help –self help books or counselling with mental health input. Vignettes were used and the low cost and anonymous method of receiving information was particularly important for young people. Age range: 12-25.</p>
<p>Penn DL, Simpson LE et al. The development of a Web site to promote the mental and physical health of sons and daughters of Vietnam veterans of Australia. J Consum Health Internet. 2006;10(4): 45-63.</p>	<p>Children of war veterans have a higher risk of suicide. This participatory action research evaluates online support for vulnerable young Australians. The facility allowed on line discussion and access to information re Australia's involvement in the Vietnam War. Technologies used built a sense of trust and shared identity with anonymity among the users, providing an alternative to face to face services for rural areas. However, a selection of 'emoticons' were added by web developer to alleviate lack of facial gestures. Age range: 13.</p>
<p>Rickwood DJ, Deane FP et al. When and how do young people seek professional help for mental health problems? Med J Aust. 2007;187(7): S35-S39.</p>	<p>School staff, primary care and youth services are more likely to act as gatekeepers to mental health services for young people. They are increasingly using internet based interventions to assist with self help. Age range: 16-25.</p>
<p>Santor D, Poulin AC et al. Online health promotion early identification of difficulties and help seeking in young people. J Am Acad Child Adolesc Psychiatry. 2007;46(1): 50-59.</p>	<p>This research study looks at a school based web site and notes its promise for self identification of emotional problems. Age range: not specified.</p>

Stephens-Reicher J, Metcalf A et al. Reaching the hard-to-reach: how information communication technologies can reach young people at greater risk of mental health difficulties. <i>Australas Psychiatry</i> . 2011;19:S58-S61.	This descriptive account highlights challenges to ICT based health services. These include inadequate access and training, lower literacy levels and the need for specialised technologies for people with disabilities. Age range: 14-25.
Vogels AGC, Jacobusse GW et al. An accurate and efficient identification of children with psychosocial problems by means of computerized adaptive testing. <i>BMC Med Res Methodol</i> . 2011; 11.	An option for identification of psychosocial problems in children is described through the use of the simulated 'item response theory- based computer adaptive test' (IRT-CAT). It was found to lead to efficient high quality identification of psychosocial issues, however, the results need to be replicated in real life simulation. Age range: 14-24.
Webb M, Burns J et al. Providing online support for young people with mental health difficulties: challenges and opportunities explored. <i>Early Interv Psychiatry</i> . 2008;2(2): 108-113.	Australian study examining the Reach Out! Programme to bridge the gap between those experiencing mental health difficulties and those seeking help. Programme is underpinned by youth involvement and promotes help seeking and reduction of stigma. Age range: not specified.
Wells M. Internet-related problems coming to the attention of school social workers. <i>Child Sch</i> . 2006;28(4): 237-242.	Study of social workers in the USA exploring their levels of awareness of internet related problems children experience. Internet related problems affect youth social and academic competence and performance in the school setting. Age range: not specified.

Results

Themes and Key Issues

1. Risks and benefits of digital technology

Children's use of the internet is often associated with a degree of risk as shown by all of the findings reported in Table 1. The risks include cyber bullying^{14,15}; sexual exploitations for example 'sexting'¹⁵; and psychological ill health including Facebook depression^{15,16}, social anxiety and loneliness¹⁷. Devine and Lloyd¹⁴ identify that girls are affected more than boys. In addition Wells¹⁸ suggests internet use appears to affect academic competence and performance in a school setting. Reported problems included issues around truancy, online harassment by peers and inappropriate use of school computers to access pornography. McBride¹⁵ adds that the age of children and their susceptibility to peer pressure puts them at greater risk when navigating the internet and Borzekowski¹⁶ notes that online media literacy skills should not be assumed. Despite the obvious hazards of internet use McBride¹⁵ stipulates that there are benefits including enhancing communication, broadening social connections and learning technical skills.

2. Health support, information and self-assessment

The internet is widely used as a 'health-seeking' tool^{16,19,20}. This appears to be an age related concept and the older adolescent is more likely to utilise the internet in this way²⁰. Using the internet as a health information source can be seen as low in cost and anonymous²⁰, but this needs to be carefully balanced against the possible harmful effects. Health advice for one young person could be construed as ill-health for another¹⁶. As gatekeepers health professionals should be aware of this dichotomy¹⁹ and seek to undertake naturalistic research to examine internet usage and experiences in order to measure the effects on health, knowledge and behaviours in children and young people¹⁹.

3. Iatrogenesis of digital technology

Internet use can be the root cause of psychological issues in young people²¹. It is also an extension of pre-existing behaviours and emotions that clinicians had already identified and were treating such as victimisation and isolation.²¹ However Gowan and Descahaine²² argue that there is a place for the internet, particularly social networking sites, to lessen isolation for those with existing mental health issues. Of prime importance is the issue that practitioners working with clients should ask clients about their internet use as part of assessment and be prepared to work with this issue^{21,22}. A possible use of the internet within practice is that of screening and identification of emotional problems^{23,24,25}.

4. Health seeking and support

Horgan and Sweeney²⁶ found that a large number, 30.8% of the 18-24 year olds in their study, used the internet to seek advice about mental health issues, predominantly depression and they allude to the idea that accessing mainstream mental health services has stigma attached. Furthermore Murie and Dickson's initiative²⁷ adds to this perception in relation to the adolescent aged 12-18 years; they argue that there is definitely a place for this type of advice. They urge that the information provided is accurate and reliable, that access should be secure and confidential, and that the design is acceptable to users. Importantly, they stress this development is supported by health service staff and professional bodies²⁷.

5. Modes of digital therapeutic support

An Australian service provides an online community forum^{28,29,30}, which aims to increase mental health literacy, reduce stigma and promote help seeking²⁸. Penn³¹ also developed a similar online support for children over 13 years of age who lived in rural and remote environments in Australia. Geographically this group of children and young people required an alternative mode of support. Anonymity and confidentiality were seen as important elements of success in supporting young people with mental health issues in both of the above studies^{28,29,30,31}. Furthermore, the anonymity issue was raised by Cleary and Walker³² who identified that investigative enquiry into sensitive issues such as mental health are often more successful via email than face to face.

6. Robotics, resilience and enabling technologies

Stephens et al³³ state that the innovative use of digital technology can be beneficial to the mental wellbeing of children and young people. Digital technology programs can promote resilience, providing they consider the literacy levels of children and young people³³. There is evidence that Sentient Robots (with social, emotive and cognitive abilities) have a place in daily life, enhancing wellbeing in the form of emotional companionship, communication and reducing isolation³⁴.

Discussion

Children and young people are engaging with digital technology on a daily basis and this is a worldwide phenomenon. Although there is variance internationally in the utilisation, it is clear that this exponential growth is a feature that cannot be ignored in society. Children and young people use this technology as a means of recreation and education, consequently it is an area ripe for development. This state of the art review illustrates the use of digital technology as an emerging paradigm in the mental wellbeing of children and young people.

There are documented risks and benefits of digital technology use in the literature. These can range from affecting school performance, increasing loneliness and social anxiety, to enhancing communication and broadening social connections. Cognisance should be given to the fact that girls appear more affected than boys. Children from the same chronological age groups can draw different conclusions from digital information. Therefore, assumptions should not be made regarding children's developmental stage and literacy level. The development of a regulatory 'safety net' should be considered when children and young people navigate the 'high wire' of the digital world.

Health promotional advice is readily available via a range of media including online support and mobile telephone applications. These approaches are valued for their perceived anonymity and low cost and are frequently used by the adolescent age group. Harmful effects, however, have been noted in the literature where self help strategies for one individual may not be effective for another. One size cannot fit all and information needs to be tailored to the individual young person and in their cultural context. This is a challenge for digital technology where self assessment and self help are requested. More research is required to measure the effect on health outcomes in children and young people using technologies for mental wellbeing.

Using digital technology for information concerning the mental health issue of depression is common among young people aged 18-24years. Mainstream face to face contact is felt to have a stigma attached and so advice via technological media certainly needs to be available. However, to have any benefit to young users, it is essential that any design must contain up to date, credible information while being secure and confidential. Professional organisations should recognise that these features need to be in place to ensure effective mental health support and trust in the technological source.

Flexible approaches to digital technologies are required to ensure maximum access by children and young people in need of mental health support. These alternative modes of support should extend across geographically diverse locations. Variability in approach and consideration of developmental stage is also important with digital technology. Younger

children often seek affirmation and help around emotional issues from family members. However, adolescents, in the formal operational stage of cognitive development, may seek mental health support on line from peers (social media) as well as digital technology in the form of interactive games, but not from family members. A move from family support systems to digital systems for mental health promotion in adolescence is an issue that families and health professionals need to acknowledge.

Innovative use of digital technology can benefit mental wellbeing including the promotion of resilience in children and young people. Devices such as mobile phones and laptop computers may become objects of attachment, as they can provide access or escape in some cases, to virtual realities. Digital technology such as Sentient Robotics may be perceived by children and young people as an ideal set up for them, and may provide companionship and lessen feelings of isolation. Harnessing this resource for the purpose of prevention and treatment of mental illness seems like an innovative and interesting development in the future.

Limitations

The small scope of this review is a limitation. Studies included in the review were from Europe, North America and Australia and it could have benefited from studies undertaken in other geographical locations. Due to time constraints only a selection of resources could be searched for evidence. This is clearly an area where published literature lags behind practice and the pace of technological development is often startling. Although many children and young people in developing countries have access to the latest technology many of these countries do not have the human and service resources to capitalise on these latest innovations.

Conclusion

This state of the art review has uncovered a plethora of issues relating to the use of digital technologies to enhance the wellbeing of children and young people. There appears to be some benefits for some children and young people who use digital technology to enhance their mental wellbeing, however, similar approaches could have a counter-productive effect. The potential for iatrogenesis needs to be considered by both practitioners and young people as there are implications that some digital technological interventions may do more harm than good. Despite this note of caution, we recognise there are benefits to this approach and recommend practitioners and service users ensure they engage with reliable and valid technological tools. Collaboration to develop, design and undertake rigorous research around technological interventions would further enhance the evidence base for these approaches.

Implications for clinical practice

As advances in technology continue at an ever increasing pace around the world, it is vital that there is contemporaneous advancement in the practitioners' awareness of the wide reaching scope of digital technology when working in the field of children and young people's mental health. It is acknowledged that internationally, childhood is difficult to define and when planning age appropriate digital resources for self assessment and help, caution must be

exercised, as it is clear that one size does not fit all. Practitioners need to have detailed knowledge of child development theory and awareness that the widespread use of technology often begins in the pre-school years. The digital navigation skills of the young service user can outstrip those of the practitioners developing interventions aimed at offering mental health help. There can be a discontinuity in digital knowledge between practitioner and the young person, however, there can also be a digital divide within the young population itself, therefore consultation and collaboration may be one way forward incorporating the additional help of software designers.

Involvement of young service users as partners in their care is a popular movement and this should be capitalised on when planning service developments around this age group. Reminders for appointment times and prompts for timing of medication via text are already used in practice in some countries and where this is established, incremental use of digital technology should be considered in partnership for mental health support. The economic responsibilities some children have, can limit their opportunities to seek help by conventional means and they may access digital technology for a range of mental health issues. These would need to be easily accessible and informative. Others may desire a more nurturing but anonymous approach to their mental health issues and consequently practitioners can provide sensitively attuned but factual information.

References

- 1 Gore FM, Bloem PJN, Patton GC, Ferguson J, Joseph V, Coffey C, Mathers CD. Global burden of disease in young people aged 10–24 years: A systematic analysis. *Lancet*. 2011;377:2093–2102
- 2 World Health Organisation. Young People: health risks and solutions [factsheet N°345]. 2011.
- 3 Patel V, Flisher AJ, Hetrick S, McGorry P. Mental health of young people: a global public-health challenge. *Lancet*. 2007;369:1302-1313.
- 4 World Health Organisation. Investing in Mental Health. c2002 [cited 2012 May 3]. Available from http://www.who.int/mental_health/en/investing_in_mnh_final.pdf
- 5 Internet World Statistics 2012 [homepage on the internet]. c2012. [cited 2012 May 24]. Available from <http://www.internetworldstats.com/stats.htm>
- 6 Chan K, Fang W. Use of Internet and traditional media among young people. *Young Consumers*. 2007;8(4): 244-256.
- 7 Livingstone S, Helsper E. Taking risks when communicating on the internet: the role of offline social-psychological factors in young people's vulnerability to online risks. *Information, Communication and Society*. 2007;10(5):619-643.
- 8 Selwyn N. The digital native: myth and reality. *Aslib Proc*. 2009; 61(4):364-379.
- 9 Ybarra ML, Mitchell K, Finkelhor D, Wolak J. Internet prevention messages: Are we targeting the right online behaviors? *Arch Pediatr Adolesc Med*. 2007;161: 138–14.
- 10 Boden M. Piaget. London: Fontana Press; 1994.
- 11 Compas, B. Promoting successful coping during adolescence. In: Rutter M, ed. *Psychosocial Disturbances in Young People: Challenges for Prevention*. Cambridge: Cambridge University Press, 1995; p. 2247-73.
- 12 Grant MJ, Booth, A. A typology of reviews: an analysis of 14 review types and associated methodologies. *Health Info Libr J*. 2009;26:91–108.
- 13 Open University [homepage on the internet]. c2012 [cited 2012 May 24]. Available from http://openlearn.open.ac.uk/file.php/2505/!via/oucontent/course/522/evaluating_checklist.pdf
- 14 Devine P, Lloyd K. Internet use and psychological well-being among 10-year-old and 11-year-old children. *Child Care in Practice*. 2012;18(1), 5-22.
- 15 McBride DL. Risks and Benefits of Social Media for Children and Adolescents. *J Pediatr Nurs*. 2011;26(5): 498-499.
- 16 Borzekowski DLG. Adolescents' Use of the Internet: A Controversial Coming-of-Age Resource. *Adolesc Med Clin*. 2006;17(1): 205-16.

- 17 Gross EF, Juvonen, J, Gable, SL. Internet use and well-being in adolescence. *J Soc Issues*. 2002;58(1): 75-90.
- 18 Wells M. Internet-related problems coming to the attention of school social workers. *Child Sch*. 2006;28(4): 237-242.
- 19 Rickwood DJ, Deane FP et al. When and how do young people seek professional help for mental health problems? *Med J Aust*. 2007;187(7): S35-S39.
- 20 Oh E, Jorm AF et al. Perceived helpfulness of websites for mental health information. *Soc Psychiatry Psychiatr Epidemiol*. 2009;44(4): 293-299.
- 21 Mitchell KJ, Finkelhor D et al. Linking youth Internet and conventional problems: findings from a clinical perspective. *J Aggress Maltreat Trauma*. 2007;15(2): 39-58.
- 22 Gowen K, Deschaine M et al. Young Adults with Mental Health Conditions and Social Networking Websites: Seeking Tools to Build Community. *Psychiatr Rehabil J*. 2012; 35(3): 245-250.
- 23 Chisolm D J, Gardner W et al. Adolescent Satisfaction with Computer-Assisted Behavioural Risk Screening in Primary Care. *Child Adolesc Ment Health*. 2008;13(4): 163-168.
- 24 Vogels AGC, Jacobusse GW et al. An accurate and efficient identification of children with psychosocial problems by means of computerized adaptive testing. *BMC Med Res Methodol*. 2011; 11.
- 25 Santor D, Poulin AC et al. Online health promotion early identification of difficulties and help seeking in young people. *J Am Acad Child Adolesc Psychiatry*. 2007;46(1): 50-59.
- 26 Horgan A, Sweeney J. Young students' use of the Internet for mental health information and support. *J Psychiatr Ment Health Nurs*. 2010;17(2): 117-123.
- 27 Murie J, Dickson, A. Think positive: a mental health promotion website for 12-18 year olds. *International Journal of Mental Health Promotion*. 2002;4(1): 26-33.
- 28 Webb M, Burns J et al. Providing online support for young people with mental health difficulties: challenges and opportunities explored. *Early Interv Psychiatry*. 2008;2(2): 108-113.
- 29 Burns J M, Durkin LA et al. Mental health of young people in the United States: what role can the internet play in reducing stigma and promoting help seeking? *J Adolesc Health*. 2009;45(1): 95-97.
- 30 Nicholas J. The role of internet technology and social branding in improving the mental health and wellbeing of young people. *Perspect Public Health*. 2010;130(2): 86-90.
- 31 Penn DL, Simpson LE et al. The development of a Web site to promote the mental and physical health of sons and daughters of Vietnam veterans of Australia. *J Consum Health Internet*. 2006;10(4): 45-63.

- 32 Cleary M, Walter G. Is e-mail communication a feasible method to interview young people with mental health problems? *J Child Adolesc Psychiatr Nurs*. 2011;24(3): 150-2.
- 33 Stephens-Reicher J, Metcalf A et al. Reaching the hard-to-reach: how information communication technologies can reach young people at greater risk of mental health difficulties. *Australas Psychiatry*. 2011;19:S58-S61.
- 34 Mackenzie R, Watts J. Robots social networking sites and multi-user games: using new and existing assistive technologies to promote human flourishing. *Tizard Learning Disability Review*. 2011; 16(5): 38-47.