

The role of technology in Australian youth mental health reform

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Abstract. This paper describes the extent and nature of Internet use by young people, with specific reference to psychological distress and help-seeking behaviour. It draws on data from an Australian cross-sectional study of 1400 young people aged 16 to 25 years. Nearly all of these young people used the Internet, both as a source of trusted information and as a means of connecting with their peers and discussing problems. A new model of e-mental health care is introduced that is directly informed by these findings. The model creates a system of mental health service delivery spanning the spectrum from general health and wellbeing (including mental health) promotion and prevention to recovery. It is designed to promote health and wellbeing and to complement face-to-face services to enhance clinical care. The model has the potential to improve reach and access to quality mental health care for young people, so that they can receive the right care, at the right time, in the right way.

What is known about the topic? One in four young Australians experience mental health disorders, and these often emerge in adolescence and young adulthood. Young people are also prominent users of technology and the Internet. Effective mental health reform must recognise the opportunities that technology affords and leverage this medium to provide services to improve outcomes for young people.

What does this paper add? Information regarding the nature of young people's Internet use is deficient. This paper presents the findings of a national survey of 1400 young Australians to support the case for the role of technology in Australian mental health reform.

What are the implications for practitioners? The Internet provides a way to engage young people and provide access to mental health services and resources to reduce traditional barriers to help-seeking and care. eMental health reform can be improved by greater attention toward the role of technology and its benefits for mental health outcomes.

Additional keywords: eHealth, models of care.

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Introduction

In Australia, one in four young people experiences a mental disorder in a 12-month period.¹ Only 30% of females and 20% of

males seek professional help^{2–6} and, even when young people access services, they do not always receive timely, evidence-based care.^{7,8} The increased uptake of new and emerging

technologies in recent years provides an unprecedented opportunity to engage young people, with the Australian Bureau of Statistics (ABS) reporting that 97% of those aged 15–17 years and 96% of those aged 18–24 years accessed the Internet during 2012–13.⁹ Herein we consider the ways that young people use the Internet and explore how it may be used to provide services that have the potential to optimise the general health and wellbeing (including mental health) of young people.

New and emerging technologies hold promise as both a conduit to and an adjunct for traditional services, and can also serve as a tool for prevention.^{10,11} The Internet is accessible, anonymous, engaging and informative, and provides an environment that empowers young people to talk about sensitive issues.¹² Not only are young people turning towards technologies to seek help, but they are also increasingly using technologies to connect with others, which can yield significant benefits for their general health and well being (including mental health).¹³

This paper examines young Australians' use of online technologies in the context of general health and well being (including mental health) to set the stage for a new model that leverages the opportunities enabled by the Internet to optimise mental health outcomes for young people. We quantify the extent and nature of young people's use of technology, with a view to inform an integrated model that enhances existing service offerings. The model is described and issues relating to its implementation are considered.

Methods

Participants

A sample of 1400 young people aged 16–25 years was recruited via computer-assisted telephone interview (CATI). The sample comprised 700 male and 700 female participants. Stratification was used to ensure that the sample was representative of the general population in terms of age, gender and geographic location across all Australian states and territories.

Materials

Participants completed measures relating to Internet use and mental health as part of the Young and Well First National Survey of Australian young people in 2012.

Internet use

Based on survey items used in the headspace National Youth and Parent Community Survey,¹² questions included current everyday habits, access to information for mental and physical health problems, attitudes towards that information and its use in terms of health care utilisation. For items regarding frequency of Internet use, participants were asked how many hours they spend using the Internet on average school and/or workdays and on non-school and/or non-workdays, as well as whether and how often they used the Internet after 11 pm. Participants were also asked how they spend their time online, including whether they have used the Internet to seek information about mental health, alcohol or other substance use problems and, if so, whether they were satisfied with the information they received. Social connection via the Internet was also explored, with participants stating whether they used the Internet to contact other young

people and talk about their problems, and the extent to which they found this helpful.

Mental health

The 10-item Kessler Psychological Distress Scale (K10¹⁴) was used to assess the frequency with which an individual experiences symptoms of general psychological distress, such as nervousness, tiredness, hopelessness and restlessness, on a five-point Likert scale (1 = none of the time; 5 = all of the time). Scores were summed to create total scores, which were then grouped into four levels of psychological distress (1 = low; 2 = moderate; 3 = high; 4 = very high) in accordance with the classifications recommended by the ABS (<http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/4817.0.55.001Chapter92007-08>, accessed 25 May 2015).

Procedure

Cross-sectional CATI using random digit dialling to fixed land-lines and mobile phones was used to make contact with young people. For the present study, 'young people' refers to those aged between 16 and 25 years. The Social Research Centre (Melbourne, Vic. Australia) conducted the interviews as an independent contract company. Participation was voluntary and verbal consent was obtained at the start of the telephone interview. Participants were excluded if they had English language difficulties or if they were uncomfortable with the interview being conducted in English. For all participants aged 16–17 years, consent was sought from a coresident parent or guardian as well as the young person before commencement of the survey. Participants were advised they could withdraw at any time, and that their responses were confidential and not identifiable. The Social Research Centre's code of practice requires that all interviewers speaking with people aged younger than 18 years must pass police and Working With Children Checks. The survey took approximately 20 min to complete.

Ethics approval for the study was granted from The University of Sydney Human Research Ethics Committee (Protocol No. 14633).

Data analysis

Survey data were analysed using IBM SPSS Statistics Version 22.0 (IBM Corporation, Armonk, NY, USA). Differences between young males and young females, as well as between those with low levels of psychological distress and moderate to very high levels of psychological distress, were assessed using either chi-squared analysis for nominal and ordinal dependent variables or *t*-tests for continuous variables. Unless indicated otherwise, significance was set at two-sided $P < 0.001$.

Results

Internet use and mental health status

Current use of the Internet by young people was almost universal ($n = 1386/1400$; 99%), with 95% ($n = 1321/1386$) using the Internet daily. Average time spent using technologies per day was 3.4 h, and there was no significant difference between males and females (mean (\pm s.d.) use 3.41 ± 2.92 vs 3.42 ± 2.93 , respectively; $t_{1380} = 0.064$, $P = 9.49$). Overall, 63% of respondents

($n=872/1383$; $n=463/687$, 67% male and $n=409/696$, 59% female) said they used the Internet after 11pm. Figure 1 shows the proportion of young people who reported using the Internet after 11 pm according to level of psychological distress.

Young people with moderate to very high levels of psychological distress were more likely to use the Internet after 11pm than those with low levels of psychological distress ($n=462/679=68\%$ vs $n=410/704=58\%$, respectively; $\chi^2_1=14.26$, $P<0.001$). Comparisons by gender revealed that there was no significant difference in rate of Internet use after 11pm between males based on levels of psychological distress (moderate to very high psychological distress: $n=212/294=72\%$ vs low psychological distress: $n=251/393=64\%$, $\chi^2_1=5.20$, NS), but there was a significant difference in the proportion of young females using the Internet after 11 pm according to level of psychological distress (moderate to very high psychological distress: $n=250/385=65\%$ vs low psychological distress: $159/311=51\%$ ($\chi^2_1=13.54$, $P<0.001$)). When asked how often they used the Internet after 11 pm, 27% ($n=236/869$) of young people ($n=132/461=29\%$ of males, $n=104/408=25\%$ of females) said they did so between six and seven nights per week.

Internet activities

The most common ways that young males and young females are spending their time online are listed in Table 1.

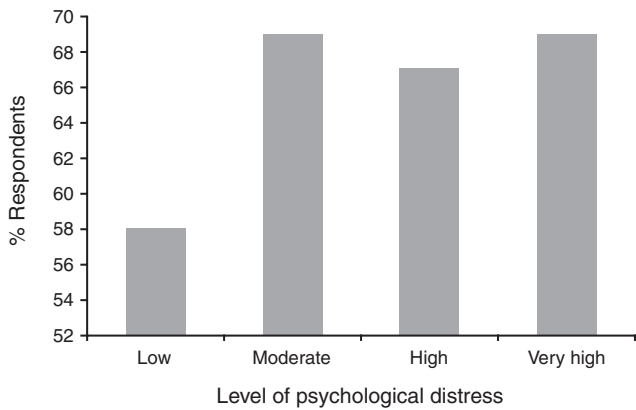


Fig. 1. Percentage of respondents using the Internet after 11 pm according to levels of psychological distress.

Overall, these include checking email, accessing social networking websites, watching or downloading or uploading videos, using the Internet for school or work and listening to or downloading or uploading music. Of the most common activities reported in Table 1, chi-squared analysis specifically revealed that young males were significantly more likely than young females to use the Internet for playing games alone ($\chi^2_1=75.68$, $P<0.001$), playing games with others ($\chi^2_1=143.47$, $P<0.001$) and watching, downloading or uploading videos ($\chi^2_1=13.39$, $P<0.001$). Conversely, young females were significantly more likely than males to use the Internet for access-ing health information ($\chi^2_1=39.83$, $P<0.001$), accessing social network websites ($\chi^2_1=7.07$, $P<0.01$), checking email ($\chi^2_1=6.99$, $P<0.01$), posting or viewing photos ($\chi^2_1=9.98$, $P<0.01$) and using the Internet for school or work ($\chi^2_1=6.90$, $P<0.01$).

Young people who reported moderate to very high levels of psychological distress were more likely to use the Internet to seek information about a mental health, alcohol or substance use problem than those with low psychological distress (53% ($362/687$) vs 33% ($235/703$), respectively; $\chi^2_1=56.05$, $P<0.01$). Furthermore, most young people with moderate to very high levels of psychological distress who search the Internet for information about mental health found it helpful. When asked whether the Internet had helped them deal with their problems, 80% ($462/575$) responded that it ‘helped a little’ or ‘helped a lot’ ($n=113/135=84\%$ vs $n=159/219=73\%$ for males and females respectively; $\chi^2_1=5.78$, NS) and 93% ($n=553/592$) indicated that they were ‘somewhat satisfied’ or ‘very satisfied’ with the information they received ($n=129/135=96\%$ vs $n=204/224=91\%$ for males and females; $\chi^2_1=2.52$, NS).

Young people affirmed that they contact their peers on the Internet and talk about their problems. Contacting other young people via the Internet was common, with 84% of respondents ($1158/1384$) indicating they did this ($n=565/687=82\%$ vs $n=593/697=85\%$ for males and females, respectively; NS). Further, there was an association between psychological distress and talking about problems on the Internet with other young people, whereby 40% ($n=231/574$) of young people with moderate to very high psychological distress had talked about their problems online ($\chi^2_1=27.79$, $P<.001$). In addition, approximately one-third of male and female respondents ($n=180/565=32\%$ and $n=201/593=34\%$, respectively) said that they talked about problems on the Internet and,

Table 1. Ways that young males and young females are using the Internet
Data show the number of respondents in each group, with percentages in parentheses

Online activity	Total (n = 1386)	Males (n = 688)	Females (n = 698)
Checking email	1301 (94%)	634 (92%)	667 (96%)
Accessing social networking sites	1285 (93%)	625 (91%)	660 (95%)
Watching, downloading or uploading videos	1198 (86%)	618 (90%)	580 (83%)
Used the Internet for school or work	1151 (83%)	553 (80%)	598 (86%)
Listening to, downloading or uploading music	1092 (79%)	548 (80%)	544 (78%)
Read or watched news	960 (69%)	484 (70%)	476 (68%)
Posted or viewed photographs	748 (54%)	342 (50%)	406 (58%)
Accessing health information	609 (44%)	244 (35%)	365 (52%)
Playing games alone	519 (37%)	336 (49%)	183 (26%)
Playing games with others	454 (33%)	330 (48%)	124 (18%)

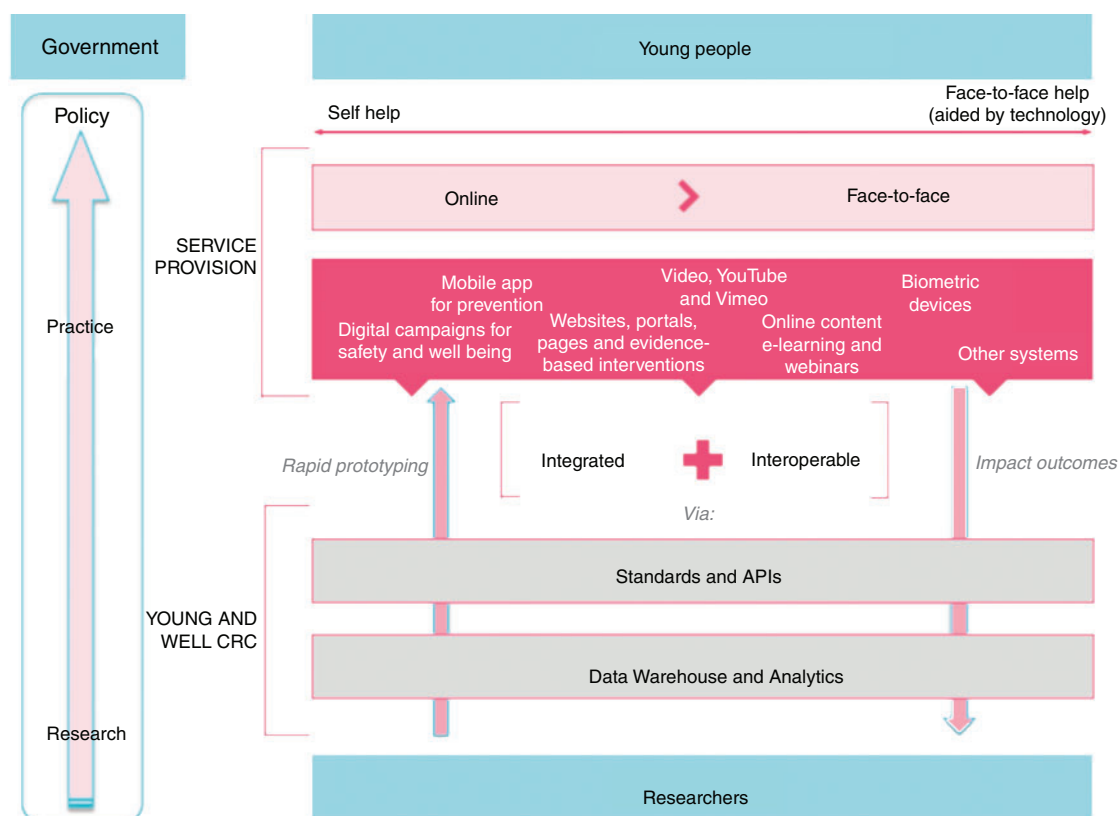


Fig. 2. A new model of integrated care for young people.

of this group, 72% (272/380) found these online discussions helpful.

Discussion

These findings from the Young and Well First National Survey (2012) reveal that the Internet is a place where young people spend time, connect with others and seek help for their problems. New and emerging technologies, and specifically the Internet, may therefore be a vehicle to improve access to mental health care for young people, and could be particularly beneficial for those who are reluctant to seek help from traditional services. Young people are both the consumers and creators of content, and they interact with the Internet in a variety of ways: passively, as a source of trusted information about a range of issues; and actively, as a means of connecting with their peers and discussing problems. Young people also reported that they commonly used the Internet to access health information, and approximately half reported at least moderate levels of psychological distress. Given these numbers, the Internet can be an important resource with the potential to enhance engagement with mental health services and be used as an adjunct to care.

Role of new and emerging technologies in the future of youth mental health reform

We propose an integrated model (Fig. 2) that builds on existing mental health services for young people and harnesses the potential of technologies to strengthen health promotion, prevention, early intervention, treatment and recovery.¹⁵

Through the Young and Well Cooperative Research Centre,¹⁶ new ideas are incubated and developed in partnership with young people (including the Youth Brains Trust, a group of enthusiastic and committed young people who oversee and inform the activities of the Young and Well Cooperative Research Centre),¹⁷ partners across the youth and mental health sector and multidisciplinary academics. This allows for rapid prototyping of potential interventions and fast-tracking of research into new and emerging technologies. The model uses the Internet as a setting^{12,18} and focuses attention on four broad areas:

1. Wellness-focused management, centred on digital campaigns, online resources (e.g. evidence-based apps and eTools) and social networking, to promote self-managed health and wellbeing for all young people. Common standards (e.g. open application program interface) support integrated online initiatives and partnerships with schools, workplaces and universities offer reach and scalability.
2. Guided self-care, in which young people are guided through a series of engaging questions to assess the nature and severity of their concerns and their readiness for care. Based on the data provided, evidence-based resources and services that are available both online and offline are recommended, and information is provided to assist with the help-seeking process. For examples of online-based support and care services, see Boxes 1 and 2.
3. Online assessment, whereby Internet-based triage protocols, data-analysis and moderator-assisted technologies can support professionals to recognise and respond to young people's

Box 1. ReachOut.com by Inspire Foundation and eheadspace

In Australia, the provision of online mental health resources and services continues to increase.^{2–5,25} The first Australian online mental health support service, ReachOut.com, sparked the meaningful dialogue surrounding the delivery of mental health support via online means.²⁶ This resource serves an evidence-based hub of information for young people facing mental health challenges themselves, as well as for those who care for them. The growth of this method of service delivery is a direct response to the 93% of Australians that use the Internet everyday, with young people aged 16 to 24 years using it more than 26 h each week;²⁷ Cyberspace is being recognised as a valuable tool in the facilitation of help seeking and in reducing the stigma associated with mental ill-health.²⁸ It is with this premise at the forefront that eheadspace was established, providing an online teleweb-service for young people to access help.³ eheadspace is the online incarnation of Australia's National Youth Mental Health Foundation, a community-based service providing advice and care to young people 12–25 years of age. It is a ground-breaking model of health care provision, offering a vast range of services that cater for both mental and physical health concerns, education, employment and substance misuse.²⁹ Both ReachOut.com and eheadspace models represent a change in practice that better aligns service delivery with young people's needs and the way they live their lives.

Box 2. Happiness Central and Project Synergy

The online environment is increasingly recognised as a critical setting for young people.¹² This places the young person in control, allowing them to access services and support privately and at their own pace to support their overall health and wellbeing (including mental health). The Young and Well Cooperative Research Centre in partnership with the Brain and Mind Centre (The University of Sydney) is in the process of building a model set to further empower the young person. With the first application set to target young people within the higher education setting, Happiness Central is a personalised health and wellbeing system, accessible on any Internet-enabled device, using apps, eTools and the latest technologies to allow the young person to set goals, monitor and track their progress. This arms the young person with the resources and information needed to take control of their general health and well being (including mental health). The technology underpinning Happiness Central is called Synergy, an eMental health ecosystem that puts young people in complete control of their data. The information collected via the interoperability of mobile apps allows the young person to monitor their own progress, but can also be shared via secure channels to facilitate clinical care and engagement with clinical services, both in an online or face-to-face setting.

mental health problems in an online setting. These technologies can supplement face-to-face services and reduce pressure on the current system of mental health care.

4. Mental illness management, which integrates face-to-face and online services and uses new and emerging technologies as an adjunct to clinical care, with a focus on recovery and maintenance. This includes the use of apps to enhance treatment, moderated therapeutic social networks and feedback through biometric technologies to monitor activity, sleep and mood.

Can the model work in practice?

In Australia, there is an interest in eMental health reform and innovation at both the policy and service delivery levels.^{19–23} The Fourth National Mental Health Plan,¹⁹ the National Health and Hospitals Reform Commission report²⁰ and the National e-Health Strategy²¹ all advocate that better use be made of innovative tools for people with mental health problems. Youth mental health workers believe that harnessing the potential of the Internet would allow them to have a greater effect on young people's mental health, particularly if structural barriers (e.g. access and security) can be overcome.

Certain aspects of the model described above have already been adopted (Boxes 1, 2).

A range of issues must be considered for the model to be rolled out and to be successful more broadly. These issues are not unique to our proposed model and have been successfully addressed in the telecommunications and banking industry using robust policy frameworks, technical controls, consumer information and quality assurance processes.²⁴

Some of the issues include effectiveness, efficiency, integration with existing services, financing and privacy. With regard to effectiveness, the potential benefits of the model include reducing the barriers to help seeking, improved equity of access (particularly for young people living in rural and remote areas) and better outcomes for young people. This effectiveness is complemented by an understanding of the cost-effectiveness of the model, and it is anticipated that because the model is designed to complement traditional services rather than replace them, overall costs may increase initially, but that access and outcomes would be improved. Consideration should also be given to the effect of the model on existing services. Changing professional practice is likely to be both 'top-down' (influencing clinical leaders, colleges, and professional associations) and 'bottom-up'; that is, the new generation of health practitioners and patients is made up of native users of digital technologies and will therefore bring new attitudes and expectations. Careful thought needs to be given to the way in which the model, particularly its more treatment-focused elements, would fit within the existing payment structures and incentives inherent in Australia's system of mental health care. Australia has a government-funded universal healthcare system, supplemented by private health insurance and out-of-pocket copayments. Uptake of the model would be improved by adapting existing funding structures to recognise and incentivise the use of Internet-based services (e.g. through the inclusion of online assessments in the schedule of benefits that are funded by the government and private providers). Finally, issues relating to privacy and security would need to be addressed to ensure that young people have confidence in, and control over, the way their data are collected, stored, used and shared.

Conclusion

This proposed model of an integrated mental health system is directly informed by understanding young people's use of the Internet. It introduces an eMental health ecosystem that spans the spectrum from mental health and wellbeing promotion to prevention. The model is designed to sit within the existing health system and can be used as an adjunct to clinical care and in the promotion of recovery. We believe that the model has the potential to improve the reach and quality of mental health care for young people, improving help seeking, increasing the use of evidence-based tools and services and reducing systemic inequities in access to mental health services.

Competing interests

IBH is a Commissioner of Australia's new National Mental Health Commission from 2012. He was a Director of headspace: the national youth mental health foundation until January 2012. He was previously the Chief Executive Officer (till 2003) and Clinical Adviser (till 2006) of beyondblue, an Australian National Depression Initiative.

IBH is the Co-Director, Health and Policy at the Brain and Mind Centre (The University of Sydney), which operates two early-intervention youth services under contract to headspace. He has led a range of community-based and pharmaceutical industry-supported depression awareness and education and training programs. He has led projects for health professionals and the community supported by governmental, community agency and pharmaceutical industry partners (Wyeth, Eli Lilly, Servier, Pfizer, AstraZeneca) for the identification and management of depression and anxiety. He has received honoraria for presentations of his own work at educational seminars supported by a number of non-government organisations and the pharmaceutical industry (including Eli Lilly, Servier, Pfizer, AstraZeneca).

JMB is the founder and chief executive officer of the Young and Well Cooperative Research Centre. IBH is a member of the Medical Advisory Panel for Medibank Private and also a Board Member of Psychosis Australia Trust. He leads an investigator-initiated study of the effects of agomelatine on circadian parameters (supported in part by Servier) and has participated in a multi-centre clinical trial of the effects of agomelatine on sleep architecture in depression and a Servier-supported study of major depression and sleep disturbance in primary care settings.

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