Using digital technologies in community mental health: The example of 'Buddy'

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Abstract: The Internet is not a 'fad' that will soon disappear, but is rather a new 'environment' in which people interact with others, engage and have experiences. The Internet is a tool with never before seen potential. Utilizing this new technology, mental health professionals can provide evidence based interventions and prevention programs to a number of mentally ill and distressed persons. The following study explores the use of 'Buddy' an online mood monitoring service to determine whether self-reflection can help people with mental health problems understand the relationship between the things they do in their daily lives and their mental state and then endeavour to change their behaviour for the better. Through the personal accounts of 12 service users, the use of 'Buddy' as a self-management tool is investigated and a number of positive and negative issues are discussed.

Introduction

Although no formal definition exists, e-technology is broadly understood to include the Internet and related technologies such as digital and Web-based television (Eysenbach, 2000). The Internet, the fastest growing e-technology in the world, is a major source of health information and has the potential to deliver enhanced services. In addition, e-technology's role in future mental health service delivery and research will continue to expand as increased numbers of consumers, caregivers, health professionals, and the general population go online, especially as the technology is refined and made even more user friendly (Cleary et al, 2008).

Internet use is increasing for people regardless of income, education, race, ethnicity or gender. It has been found that more than 10% of the general population (and more than 20% of those with any history of mental illness) use the Internet as a primary source of mental health information (Powell & Clarke, 2006). As the Internet plays a significant role in mental health information seeking, and because of its widespread influence, e-technology is now seen as a potential platform for delivering health-enhancing interventions and services, including research to its users (Bowen et al, 2007).

The term 'e-health' encompasses the Internet and related technologies and aims to improve health care by enhancing communication pathways between service providers and patients (Eysenbach, 2001). A number of studies have shown that patients are often dissatisfied with their provider interaction, frequently because of inadequate or poor communication, semantic and syntactic difficulties, specialized terms, complex sentences, and the absence of an affective mutual understanding (Taylor et al, 2002). For some consumers interacting with a computer may be easier than interacting face to face with mental health staff (Farrell et al, 2004). The concept of 'e-mental health' refers to 'mental health services and information delivered or enhanced through the Internet and related technologies' (Christensen et al, 2002). In a sample of individuals with access to the Internet, those with psychosomatic or psychiatric disorders used e-health more often than did those with general medical problems (Haviland et al, 2003). Fox et al (2000), found that 26% of adult Internet users have searched for information about a mental illness and multiple surveys indicate that around 25% of young people have similarly used the Internet as a source of mental health information (Rideout, 2001).

The World Wide Web is increasingly recognised as a powerful tool for intervention and prevention programs (Levy & Strombeck, 2002) with Internet based programs shown to improve a range of mental health problems (Griffiths et al, 2007). In one program in Perth, Western Australia, e-health was found to enhance depression recovery (Robertson et al, 2006). The program included e-consultations, psychoeducation, progress monitoring, and evidence-based therapy. In addition, Klein & Richards (2005), investigated an individual therapy intervention for patients with panic disorder provided by the Internet. Their study showed the Internet based

treatment revealed significant reductions in measures pertaining to panic, negative affect, body vigilance, self efficacy and managing panic.

Mobile phone

As well as the Internet, mobile telephone technology has become common place around the world and is one of the most widespread of electronic devices. Over the last few years mobile phone density has increased rapidly. While mobile phone penetration in Europe was 70% by the end of 2001, it increased to 85% in 2005, and today it totals around 34 million subscriptions in Britain alone. In many countries, mobile phones now outnumber land-line telephones, with most adults and many children now owning one. With this high level of mobile phone penetration a 'mobile culture' has evolved, where the phone becomes a key social and cultural tool (Preziosa et al, 2009).

In a review study of mobile phones supporting behaviour change, Fjeldsoe et al (2009), found that SMS delivered interventions can have short term positive behavioural changes. The use of daily text messages in the CBT treatment of bulimia nervosa have been shown to help with self-monitoring, improved attendance at sessions, and treatment efficacy (Shapiro et al, 2010). Individual case studies have shown that the use of mobile applications reduced stress during commuting (Riva et al, 2006), and facilitated the treatment of phobias, where it was not practicable for the therapist to be involved with exposure exercises (Morris et al, 2010). Research has also looked at mobile diaries being used in CBT based wellness studies, aimed at improving healthy behaviour and weight management (Matilla et al, 2008), and the use of text messages to support smoking cessation (Rogers et al, 2005). Results also suggest that text messages, that are reminders about treatment and with useful tips on education, may be a medium to allow people with chronic health problems to make their disease comply with their lifestyle and not the other way around (Neville et al, 2002).

Self-management

Service users are changing the way they view their role in their own health (from physician-directed to self management) and it is partly the availability of health information on the Internet, which is changing many patients from passive consumers of healthcare to being empowered participants in their own health maintenance. (Henwood et al, 2003). So what is self help? It is difficult to define self-help, self-management or self-care. The terms are often used interchangeably, although

self-management is seen as a more integrated and comprehensive combination of individual self-care, together with the negotiation with health services necessary for chronic disease management (Richards, 2004).

For many service users self-help is about widespread lifestyle strategies, incorporating concepts such as wellness and recovery (Faulkner & Layzell 2000), with the aim to increase activation in dealing with chronic conditions, enhance adherence and 'ownership' of treatment regimens and increase perceived control over the impact of the illness (Salyers et al, 2007). Recent US reviews suggest that 'self-treatment' through bibliotherapy in depression and anxiety, achieves clinical effects roughly equivalent to the average obtained in studies of psychotherapy (McKendree-Smith et al, 2003). The recent UK NICE guidelines on depression, have the concept of self-care as an underpinning principle. It is proposed that first level services are explicitly constructed around facilitated self-help as the principle health technology. Wagner et al (1996), provide evidence that self-management patient-physician partnerships are associated with better outcomes and according to a meta-analysis, that reviewed 40 well designed outcome studies of online self-help treatment, online self-help appears to be more effective than no treatment at all, and just as effective in most cases as treatment administered by the therapist (Scogin et al, 2003).

Behavioural activation

There is accumulating evidence to suggest that the things we do affect how we feel. Lykken (1999), suggests that as much as 40% of our mental wellbeing could be down to our outlook and activities. The Foresight Report (2008) for Mental Capital and Wellbeing, suggests that there are five things we should do to ensure good mental wellbeing – connect, keep learning, give, take notice and be active. *Connect* refers to connecting with the people around you i.e. family, friends, colleagues and neighbours. Users are asked to think of these as the cornerstones of their life and invest time in developing them. They are taught that building connections will support and enrich their everyday lives. With *learning*, users are asked to try something new, perhaps rediscover an old interest, sign up to a course, take on a new responsibility at work, learn to play an instrument or how to cook your favourite food. They are encouraged to set challenges for themselves which they will enjoy achieving. Users are reminded that learning new things will make them more confident as well as being fun. *Giving* refers to doing something nice for a friend, family member or even a stranger. Also it could be volunteering or joining a community group. It is important that users can see themselves and their happiness linked to the wider community as it can be incredibly rewarding and also creates connections. Clients are asked to *take notice* of the things around them, to be curious, catch sight of the beautiful, remark on the unusual and notice the changing seasons. They are advised to savor the moment,

whether they are walking to work, eating lunch or talking to friends. They should be aware of the world around them and what they are feeling, as reflecting on their experiences will help them appreciate what matters to them. Finally, *being active* is self-explanatory. It refers to going for a run, walk, cycle or dance. Users are encouraged to do an activity which suits their level of mobility and fitness, as a number of studies have demonstrated a positive relationship between exercise and mental health and have been found to reduce the likelihood of relapse (Fox, 2000).

Methodology

Aims

- To investigate if self-reflection through empowering web tools can help people with mental health conditions understand the relationship between the things they do in their daily lives and how it affects their mental state.
- To test whether text alerts reminding service users of appointments with their clinicians reduce DNA rates (data on this are not currently available).

Design

Ethical approval was obtained via the National Research Ethics Committee structure and research and development support was granted by the Psychosis Clinical Academic Group. A consent form was signed by each participant before the trial began.

Both qualitative and quantitative measures were used. To begin, a semi-structured interview was conducted, which allowed for focused, conversational, two way communication. Questions included a general psychiatric overview, previous forms of treatment and intervention, current treatment, relationship with clinician, moving on from therapy and what a normal week consists of. Participants were also asked about their knowledge of technology and the Internet in order to assess the relative frequency of use.

Two sets of questionnaires were completed by participants before the start of the Buddy project, in order to get an overall average score and to provide a stable baseline. The Warwick-Edinburgh Mental Well-being Scale (WEMWBS) was used to assess positive mental health (mental well-being). It is a 14-item positively worded scale with five response categories. This is an established scale with good psychometric properties (Stewart-Brown et al, 2009). Secondly, the Manchester Short Assessment of Quality of Life (MANSA) questionnaire was used. This 16 question scale contains objective and subjective questions in eight life domains including social relationships, safety, leisure, finances, family, accommodation, living situation, and work (Priebe

et al, 1999). Finally a third questionnaire, consisting of a 5-point rating scale was constructed by the researchers, which assessed how often participants used their local CMHT, how satisfied they were with the service, their understanding of their condition and general demographic questions.

Proceedure

Participants received a personalised text message every evening at 8pm, prompting them to record their daily activities and rate their mood on a scale of 1-5; one being 'well below average' and 5 being 'well above average.' This information was then logged onto their own private web page, which allowed them access 24/7 in order to make a connection between the things they do and their mental state. The aim was to allow users to be able to track their moods, thoughts and feelings to help them stay in control.

Ownership of sessions was transferred to users, as they were asked to set the agenda for their meeting 24 hours in advance. This enabled service users to feel more in control and allowed clinicians to have a much clearer view of the relationship between their patient's life and their condition, making one to one sessions more informed and useful. Also during weekly sessions participants were asked to rate how they thought they had fulfilled the five-a-day. They were also asked to reflect on the week gone by, and to then set goals for the forthcoming week.

Participants also received a text reminder 24 hours in advance of their next appointment with their clinician, with the aim to reduce Did Not Attend (DNA) rates. Weekly progress reports were also sent every Friday, containing positive messages about the week gone by.

Analysis

Responses were confidential and data were anonymised for analysis. The Statistical Package for the Social Sciences version 19.0 for Windows was used.

Sample characteristics

A total of twelve participants took part in the trial with one dropping out after two weeks. There were 7 women and 5 men in the respondent sample. The mean age for females was 33 years and 49 years for males. Of the sample, 7 were unemployed and 5 employed. All had a self-reported history of mental health problems, with 8 suffering from a mood disorder and 4 reporting psychosis. Eight participants were

taking prescribed medication, while 4 were not. One participant who self-medicated through Internet purchased drugs, was categorised into the non-medication sample. The entire sample had access to the Internet and mobile phones but knowledge of technology ranged from being excellent to poor. The mean WEMWBS score was 38.7, the mean MANSA score was 48.05 and the mean score for the independent questionnaire was 44.

Results

Compliance and usage patterns

Of the total sample, 7 out of 12 users completed an entry on more than 70% of occasions, with 5 users having over 90% compliance rates. One user had 100% compliance doing it every day for 10 weeks. The lowest number of entries was completed by participant two, who only logged 12/62 or 19.35%. The most common rated point on the scale was the 'average' one, with 202 entries falling into this category. The least used scale was the 'well above average,' with only 8 logged responses or 4.14 %. Participants tended to have more 'above average' days than 'below average' or 'well below average' days, with 93 entries consuming this tag compared to a combined total of 91 for 'below' and 'well below average' days.

Table 1
Distribution of responses to 'Buddy' and percentage response rates.

Participant Number	Well below average	Below average	Average	Above average	Well above average	Overall Completed Entries (%)
1	14	0	0	0	0	93.3
2	9	2	0	1	1	19.3
3	7	10	18	19	4	95.0
4	9	29	19	1	0	68.0
5	0	0	57	5	0	100.0
6	1	8	11	10	0	62.5
7	5	15	21	15	0	96.5
8	1	6	12	19	1	81.2
9	3	6	26	4	1	72.7
10	0	8	23	11	0	77.7
11	2	4	3	3	0	48.0
12	0	0	12	5	1	90.0
Total	51	39	202	93	8	75.4

Another observation was that users tended to reply at night, within two hours of receiving the message. Only one participant (4) would reply very late at night, sometimes in the early hours of the morning. In addition, it was noticed that missed entries tended to happen more at the weekends, than during the week. Participant three explained that he would miss an entry if he was out with friends or if he received a text from someone else at the same time. Some users reported feeling 'guilty' if they missed an entry and would try and complete it the next day.

Typical responses

The main aim of 'Buddy' was to get participants to reflect on their days activities and how that impacted on their mental state. There was a wide spectrum of responses from the different users. Some would make the link between what they were doing and how it made them feel 'I had meeting with a frame shop about an art fair- Lots of work to do and then met new web designer- gym couple of hours then met new friends at event and now work. Ate healthy, feel positive' (participant 8). Participant 3 also made a connection 'did not leave the house today. Slept for the most part. Feel rotten. Regret not going for a run...' Others used Buddy to simply comment on their day 'not a good day' (participant 10), rather than giving an explanation of why it wasn't a good day. Indeed participant 6's entries, only consisted of one or two word responses, 'worked, saw friend' or 'cinema.' One user (5), listed all the activities he completed in a day, 'Done daily walk and went to shop for a baguette for lunch. Then went for another walk came home and watched tele.' He scored the most average days and it was very rare that he scored himself 4 or more.

In addition users who inputted their notes online, tended to write a lot more than those who responded via text message. Participant two wrote 3930 words in one sitting, whereas another user (6) would sometimes only respond with one word. Furthermore users tended to write more information, whenever they were having an above or below average day. There were some differences between the age of participants and length and details of their account. Whether or not these findings are significant will have to be decided upon when the trial is complete at the end of August.

Early findings and discussion

At the time of writing the trial is not yet complete so it is not possible to objectively evaluate the benefits and the efficacy, of whether 'Buddy' is a useful self-management tool for people with long term mental health problems. However the pre-trial observations raised a number of issues. Firstly, opinions were mixed in terms of

sharing and viewing of information. As the Internet creates an environment where patient information can be easily accessed and disseminated, some participant's, were hesitant to use the online service and were worried about who could access and view their information. One participant (2) verbalised that he was 'slightly concerned at how explicit to be' as he worried who would be reading his entries and laughing at how 'sad' he was. Another said 'I didn't write about going on my bike because I'm not supposed to be on it… I was worried I would get into trouble' (Participant 4).

However others felt very open about the nature of the material they discussed, participant 8 openly discussed her relationship with her boyfriend online and how he made her feel. She would discuss her sexual encounters, her drug habit and also her eating and exercise regime. Participant 11 also disclosed a lot of personal information to 'Buddy.' In many of her entries she spoke about her son and how she feels she cannot care for him. She too would talk about her drinking and drug taking, her ex partner, her family and the fact that she feels 'unloved' and isolated. Research indicates that people self-disclose a greater degree of sensitive information online, compared to in person (Newman et al, 1997). One participant (7), commented that she would find it easier to tell 'Buddy' her thoughts and feelings, rather than discussing them openly with her clinician. She saw 'Buddy' as a platform for initiating communication with her clinician and liked the fact that her therapist would see her entries before a session and would then be able to ask about certain topics. More research is required into the effects Buddy has on creating a more open and honest environment.

Another early insight is that Buddy helped users recognise patterns in their behaviour. Participant seven was able to link her day's activity to her improved mood, 'went for a lovely long walk then out for dinner.' This activity clearly made the user happy as she rated her day as a 4, meaning that in future if she was having a below average day she could log on to Buddy and see what made her have a good day, and then change her behaviour to suit. Also with participant 3's comments, patterns could be easily comprehended. He highlighted, 'social encounters are when I have my good days, whereas sleeping and smoking too much are clear indicators off a bad day. I was surprised at the fact that on most weeks I have at least one above average day because when I get glum I feel everything is black.' User 5 was intrigued to notice that 'any day I spent with my Aunt would mean my day rose to above average.' Finally user 4 spoke about how 'spotting patterns can help as it allows you to see what you're doing or not.' Although the above is a positive finding, it is essential to conduct further research into how Buddy can be used as a tool to aid behaviour change.

One major threat to research projects that include mental health consumers is the illness itself. Traditionally if a study participant became unwell and could not participate in research on a given day, the project's protocol was breached, and the study faced significant time delays and increased costs (Cleary et al, 2008). As individuals had access to Buddy 24 hours per day, 7 days per week, it allowed unwell participants to continue to take part in the study at a time and place most convenient to them. In fact many users stated that Buddy became incorporated into their daily

routine. 'Most of the time I would get ready for bed and then reply' (participant 4). Another said 'I would reply immediately after receiving the prompt' (participant 5) and participant 3 stated 'It made me take one minute to stand back and objectively look at my day. It was a healthy routine to get into.' One interesting statistic is that although 82% of participants reported at least one below average day they were still able to complete an entry. One participant's entry stated, 'spent the whole day in bed' and rated his mood as well below average. However he was still able to reply to the Buddy text. This highlights that the usage of Buddy doesn't increase or decrease depending on someone's mood and highlights its potential use for people who are suffering from low mood, depression or anxiety.

Limitations of the study

One of the main limitations to the study was the sample size. As only 11 participants completed the trial, it is not representative and therefore caution does have to be taken when interpreting the results. Furthermore the trial was a small time limited study, 10 weeks altogether, therefore not a long time for individuals who have concrete behaviour patterns embedded into their lifestyle to change dramatically. Also user responses could have been affected by respondents wanting to provide socially desirable answers, but as no exit interviews have yet been conducted this can not be taken definitively. In addition one complaint that many of the service users had was that it was costing them money if they text. As the majority of service users who took part were unemployed this was a big drawback for them and could have been the result of many missed entries. Finally as the trial is still ongoing it is too early for data on attendance at meetings, health outcomes and long term compliance to be appraised.

Conclusion

It is clear from the evidence above, that 'Buddy' is being used in different ways by different individuals. It is apparent that it has the potential to be used as a platform for users in clinical sessions to allow for more open and honest discussion therefore creating better communication links with clinicians. It may help service users move into the realm of self help by recognising patterns in their life and also helping them build a routine around objectively evaluating their day. The study presented above makes a contribution to the arena of self-management in mental illness. However we believe that a more in depth study, with a larger cohort is required before making any definitive conclusions about the validity and efficacy of 'Buddy.'

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