

Review Article

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Social Influence, Addictions and the Internet: The Potential of Web 2.0 Technologies in Enhancing Treatment for Alcohol/Other Drug use Problems

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The past decade has seen the proliferation of e-health applications across disease categories. With the emergence of the next generation of Internet-based applications, Web 2.0, there are increasing opportunities for integrating these technologies into treatment approaches for alcohol/other drug use problems, in a way that engages and empowers like never before. No evidence currently exists to demonstrate the benefits of Web 2.0 applications, such as social networking and social media, on alcohol/other drug use problems. However, social learning and influence theories point to the possible mechanisms of action and effectiveness. More research is urgently required to examine the potential of Web 2.0 applications on alcohol/other drug use problems.

Introduction

In 2011, 78% of the Australian population of almost 22 million were Internet users [1], with the highest rates of access reported among young people 93%, [2]. Similar rates of Internet use are reported in the USA (77% in 2010), representing close to 240 million people [3].

The Internet has become an important source of health information and support. It is estimated that 80% of Internet users in the USA look for health information online, representing 59% of all adult Americans. Among people aged 18-29 these figures rise to 92% of individuals online, and 71% of all individuals, who will seek health information online [4]. After e-mail and the use of search engines, searching for health information is the most popular online activity for adults [5]. People also frequently engage with online communities to access support for health-related problems [6], using a variety of forums and social networking sites, such as Facebook [7,8].

There is great, but as yet unrealized, potential for the field of addictions in integrating technological applications into the treatment environment. For example, research testing the efficacy of computerized psychological treatments for alcohol/other drug use (AOD) problems has indicated that, coupled with brief weekly therapist support, computer-delivered treatment is as successful in reducing alcohol, cannabis use and depression as face-to-face delivered treatment, even among those with severe symptoms [9,10]. In particular, technology-based interventions for depression are at least twice as effective when offered in the context of some form of guidance or support [11], however the addition of support potentially decreases the accessibility of these important forms of treatment. The emergence of Web 2.0 technology may provide a solution that incorporates all of the convenience and efficacy of internet-based treatment delivery, whilst providing a platform for the development and maintenance of social connectedness and support that are essential mechanisms for effective treatment. However, very little research exists examining the use of these technologies in relation to AOD use problems and their treatment. This review aims to summarize the literature on the use and potential of Web 2.0 applications, as a social influence tool, in the context of health behaviour change, and to apply this literature to the AOD field [12].

Social Influence in Alcohol/Other Drug use Problems

Social learning and social influence theories suggest that

individuals learn within a social context, with changes in thoughts, feelings, attitudes, and behaviors resulting from interactions with other individuals or groups [12,13]. In the context of addiction, these models highlight the importance of social factors in the initiation and maintenance of problematic AOD use, suggesting that misuse is a learned behaviour that is acquired through a process of observation, modelling, imitation, and social reinforcement.

Evidence suggests that the onset and development of problematic AOD use, which occurs most often in adolescence and young adulthood, is driven by psychosocial factors [14]. For example, twin studies indicate that social phenomenon such as contagion override any genetic predisposition to alcohol misuse in a young person [15]. Longitudinal evidence also suggests that social influences are more important than cognitive and behavioural factors in predicting initial involvement with alcohol [16]. Two of the most significant risk factors for problem drinking are also social; exposure to a pro-drinking social environment and holding positive expectancies about alcohol use [17,18], with peer groups being more powerful than parents in this regard [19, 20]. Peers are believed to contribute to adolescent AOD use both directly and indirectly through several complex mechanisms, including modelling; interpersonal persuasion; shaping norms, attitudes, and values; and by providing opportunities and support for AOD use [20-23].

It has been demonstrated that social influences can also shape positive AOD-related expectancies [24]. Positive alcohol-related expectancies (such as, "drinking helps you relax") are a more important predictor of alcohol misuse than are negative expectancies [25], and have been associated with initiation and escalation of adolescent alcohol use [26,27]. Perceptions of alcohol use behaviour, even where they are

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made in error, can be as influential in the development of drinking norms in young people as actual observation of drinking behaviours. For instance, Prinstein and Wang [28] reported that adolescents' perceptions of peer behaviours related to alcohol strongly predicted their own. However, this perception was an overestimation of their peers' actual behavior. This 'false consensus' effect, is associated with higher risk of engagement in AOD use behaviours among adolescents [29].

For several decades, social influence theory has also been used to promote positive and desirable AOD-related behaviours, most notably in the context of prevention and intervention programs for substance use disorders [30-33]. Although early use of social influence models in the AOD field were largely limited to smoking prevention in young people, the success of these programs has led to the approach being applied more broadly [34-37]. For example, therapeutic communities in drug rehabilitation programs provide the opportunity for people with AOD use problems to observe other people using positive social skills, and the chance to practice using new methods of social interactions [38]. Teaching and practicing appropriate social behaviours in these settings will assist the person to develop more open and honest ways of having their needs met, and feeling more at ease in society. Similarly, therapists have drawn on social influence theory, particularly in terms of modelling of healthy behaviours, in addiction and in the treatment of mental health problems [e.g., 39-41]. AOD treatments employing motivation enhancement techniques will frequently use the "decisional balance technique", designed to encourage consideration of the importance of a range of environmental influences and personal or social factors in maintaining and changing AOD use behaviours. This technique has been shown in research to be associated with the strongest improvements in AOD use disorders of the motivational approaches [42].

Social Networking and Health

Recent advances in web and mobile technologies offer tremendous opportunities for individuals to connect online and provide a new environment for social influence to occur. No longer are websites merely places that web users visit, rather they are destinations where people interact, contribute, share and actively participate [43-45]. This new epoch of Internet use is known as Web 2.0; "an umbrella term that is used to refer to a new era of web-enabled applications that are built around user-generated or user-manipulated content, such as wikis, blogs, podcasts and social networking sites" [46]. The term was introduced in 2004 to describe the shift in consumer demand and application functionality, with the main difference from Web 1.0 being interactivity [47]. The terms "social media" and "social networking" are often used to describe the tools, applications, and functions associated with Web 2.0, which make it easier for people to listen, interact, engage and collaborate with each other using the Internet.

The growth of online social networks and their penetration into everyday life has been immense. A nationally representative survey of American youth found that 73% of online teens and 72% of young adults now use social networking websites [48], with a survey among college students in the USA revealing that approximately 97% at least own a social networking profile [49]. The diffusion of Web 2.0 into the youth population is thus almost complete, highlighting this technology as an important tool in reaching young people, a notoriously difficult group to encourage into traditional health settings. Social networking also appears to transcend class and cultural groupings in society, with Kontos and colleagues [50] reporting no significant differences in use of social networking sites according to race, ethnicity, or socioeconomic

status. Facebook is the most widely used social networking platform with approximately 800 million users globally [8]. Social networking has been described as "the most significant advance in persuasion since the radio was invented in the 1890s" [51], capturing 97% of social networking users and 60% of all Internet users [52].

As social support, integration, influence and social networks play important roles in behaviour change and emotional health [53], social media offer new opportunities for identification and intervention regarding health behaviours [54]. Use of the growing number of Web 2.0 applications is increasing, particularly for health wikis (e.g., Medpedia); health-focussed social networking sites (e.g., Patients Like Me, Trusera) and support groups (e.g., Daily Strength, Rareshare); health social bookmarking (e.g., Peer Clip); ratings and reviews of healthcare providers and organizations (e.g., iMedix, Vivu); electronic health record repositories (e.g., Cure Together); general social networking sites (e.g., Flu Tweets), and other data platforms (e.g., Health-Map, Sick City); health video-sharing websites (e.g., icyou.com) and podcasts; health-focused blogs; and health topic-based groups within virtual communities such as Second Life [55]. Despite this, only a small body of research has investigated the impacts of participating in these kinds of interactive health-related sites on key health outcomes.

Two studies, for example, have found engagement with online communities to be associated with improved social and emotional well-being, improved quality of life and more active coping [56,57]. Online communities offer users the opportunity to connect with others in similar circumstances, even if these people are not locally available, and can be more convenient than accessing support in person [58]. Web 2.0 sites offering online peer support have been postulated to improve mental health, including depression, through the provision of social support [59], and the use of online social networking has been found to be positively related to increased self-esteem, satisfaction and well-being among college students [60].

Like any tool or intervention, the key to its success lies in engaging the target population with the intervention and retaining them on a regular and ongoing basis. Web 2.0 applications appear to meet this challenge, with research indicating that the majority of social network users update their profiles at least weekly for an average of five hours, and one third report daily use [48]. Further, the more often people visit and interact with social networking sites, the better the potential outcomes. For example, a web survey of 2,603 randomly selected college students found positive relationships between intensity of Facebook use and students' life satisfaction, social trust, civic engagement, and political participation [61]. Furthermore, it has been suggested that 'competition' in maintaining good health in patient-to-patient social media exchanges may also give rise to more positive outcomes. For instance, Patients LikeMe.com allows individuals to display graphs of their health data and other characteristics that are not perceived to be overly private by the patient [62]. However, this theory remains untested.

As a result of these promising early findings, health researchers have turned their attention to how Web 2.0 applications might be used to encourage uptake of existing evidence-based treatment programs. In a recent meta-analysis of Internet-based behaviour change interventions, Webb et al. [63] found that tailored text messages were highly effective in promoting interaction and engagement with a treatment program, which was associated with more positive health outcomes [64]. Web 2.0 applications can work in a similar way. Chatterjee and Price [65] suggest that social media, particularly when combined with mobile devices, has the potential to more intimately and interactively guide adherence with

care plans or behaviour modification interventions. However, very little research has directly tested this approach for any health behaviour, and none examines its use in the context of addiction.

Richardson et al. [6] conducted one of the only randomized controlled trials to test the effect of online social networking on health outcomes, adding a social network component to an Internet-mediated walking program among 324 adults at risk of cardiovascular disease. Participants randomized to the 'online social networking' condition could post and read messages on the intervention website, while those in the 'no social networking' condition could not. Both conditions increased their average daily steps, with no significant differences between the groups. However, online social networking participants remained engaged in the program significantly longer than their counterparts and were more likely to complete the program. This suggests Web 2.0 technologies, and social networking applications in particular, may help improve patient engagement, a frequent challenge among people with AOD use problems. Even in the broader health context, attrition remains a significant problem for existing efficacious e-health interventions for behaviour change and emotion regulation [66-68]. Eysenbach [69] suggests that online social networking may be an important conduit to increasing engagement with existing online self-monitoring and health improvement programs.

Social networking sites such as Facebook may indeed be an ideal way in which to engage people, with a view to influencing problematic AOD use behaviours. These sites have the potential to function as a platform for promoting and establishing (positive and negative) norms of behaviour, particularly among young people who are the most prolific users of these applications [70]. For instance, in a sample of 500, 18-year-olds on MySpace, 41% displayed references to alcohol use in a two and half month period [71]. A subsequent qualitative study suggested that adolescents often viewed alcohol references displayed on other individuals' profiles as accurate and influential representations of alcohol use [72].

Adding further weight to the acceptability of internet-based approaches to AOD-related issues is the Climate Schools program; a collection of web-based AOD prevention courses delivered in schools by educators to promote student health and wellbeing. The evidence for school based prevention programs has recently been reviewed [73]. In this review of 53 trials, six of the 11 trials evaluating alcohol-specific interventions showed some evidence of effectiveness compared with the standard school curriculum, as did 14 of the 39 trials evaluating generic interventions which showed significant reductions on alcohol use measures. Included in this review was the Climate Schools program, for which a cluster randomised controlled trial among 764 school students (13-14 years of age) was conducted in 10 Australian secondary schools. Results revealed significant improvements in alcohol and cannabis knowledge, a reduction in average weekly alcohol consumption and a reduction in frequency of drinking to excess in those students completing the alcohol and cannabis courses relative to those who completed their usual health subject. These differences were maintained at six and twelve month follow-up. Climate Schools was also found to be acceptable by teachers and students as a means of delivering drug education in schools [74-76].

Proposed Mechanisms of Effectiveness of Web 2.0

Although research has not specifically addressed the use of Web 2.0 in an addictions context, experts suggest that online social networking among people with chronic medical problems is associated with enhanced feelings of empowerment and increased social support

relative to those accessing information and support via traditional face-to-face means [77]. It is proposed that the following mechanisms set the scene for the such benefits [78].

The use of information as power: Access to the plethora of information online means that people are better informed about their health problems, which is associated with increased treatment compliance, patient satisfaction and health outcomes [79]. Like never before, Web 2.0 applications mean that lay-people (i.e. non-medical professionals) can use the Internet to create and share new information about medical conditions, based on their individual experience of illness. Importantly, this gives a greater voice to people with health problems, with greater recognition of this voice coming from health professionals [80].

Aggregation into power groups: Traditionally, people with illnesses, particularly chronic and stigmatizing illness such as mental or AOD use disorders, remain socially isolated from others experiencing these illnesses, and from the general community at large [80]. However, the Internet, and in particular Web 2.0 applications provide a platform for sharing illness experiences such that illness is an increasingly public experience. The positive relationship between strong and supportive social relationships and health outcomes (and conversely, the negative relationship of isolation and limited social networks with poor health) has been well demonstrated [81-83]. Thus, the potential of social media to enable the formation of peer-support groups online is a significant advantage, as both off- and online support groups have been found to be beneficial in achieving sustained behaviour change [84-86], with the potential for reducing stigma and isolation. For example, in an analysis of patient messages on the online support community, PatientsLikeMe.com, exchanges between patients were found to be beneficial for self-management of chronic diseases [87,88]. Models of social support suggest that behaviour change is mediated in part through information exchange, instrumental or emotional support, stress buffering, or improved self-efficacy [89].

The ability to control the relationship with organizations and other individuals: The freedom to control one's choices in nonlinear environments has been shown to enhance comprehension and engagement, often by enabling the person to avoid information and interactions they feel are irrelevant or uninteresting [90].

Involvement in the creation of online content: Personalization required via social media necessitates interactivity, and this interactivity is believed to increase engagement by focussing user attention on content [91,92]. This interactivity has also been associated with increased levels of cognitive elaboration and recall of content [93].

The potential for use in AOD Treatment

Many people experiencing AOD use problems report isolation from family, friends and society, and a narrowing of behaviors and experiences in favour of those associated with acquiring and using the substance and recovering from its effects. A range of unmet social needs exist, including social stigmatization, poor access to treatment services, and a general lack of knowledge about available treatment options and advances, and research related to their problems [94]. In particular, people with AOD problems can become immersed in the daily aspects of managing their use, becoming increasingly cut off from conventional life, with nothing outside of their use to look forward to [80]. Often as a result of this, engaging people in drug and alcohol treatment settings is more difficult than for other health behaviors. This makes accessing treatment services, keeping appointments, and developing and maintaining motivation a challenge [95]. For example, the 2007

National Survey of Mental Health and Wellbeing in Australia reported that 88% of the adult population meeting criteria for a substance use disorder did not seek any treatment, and of those who did, most saw their general practitioner, rather than specialist drug and alcohol treatment services (8%) [96]. At each stage of the treatment process (access, retention, alliance), social factors are suggested to have an impact on the likelihood of engagement for people with AOD disorders. Thus, Web 2.0 applications can reach out to people with AOD use problems, regardless of severity, serving to alleviate boredom, assist in broadening the scope of experiences to positive non-drug related activities, and to encourage and reinforce treatment seeking efforts and benefits. In this way, emotional support can be offered, promoting a sense of belonging and personal worth to the individual; and instrumental, practical aid can be accessed, for example, by giving tips on help-seeking or advice on coping with cravings [77].

Recently, there has been increased demand for AOD treatment, particularly among young cannabis users and socially-integrated drug users. It has been suggested that these people may feel uncomfortable with 'traditional' treatment centres [97], but concern raised about the inability of AOD treatment services to meet this increased demand even if people willingly accessed these services [98]. The use of Web 2.0 technologies has the potential to offer support that is accessible at any time and in locations best suited to the AOD user, capitalizing on opportunistic treatment seeking, without significantly impacting on workloads and capacity of available treatment services. Furthermore, such technologies have the capacity to preserve anonymity and eliminate stigmatization in a way that traditional services and support groups cannot.

It has also been shown that Internet use transcends socioeconomic divisions, as do social networking activities, with AOD users reporting equivalent rates of Internet access and usage as those who do not use substances [99]. This finding suggests AOD users are just as familiar with such technologies as information- and help-seekers with other conditions, and thus, potentially, no less likely to utilise them.

Concerns

Despite the potential advantages, some concerns exist about the growing use of Web 1.0 and 2.0 technologies in healthcare. One particular concern has been the role the Internet has played in facilitating lay expertise [100,101], with issues about the reliability of the source, the information, and the user's interpretation of this information [102]. Critics of e-health as a concept have argued that information (in and of itself) does not equate to knowledge or empowerment [102]. In numerous online forums, laypeople distribute available scientific medical knowledge, but they also gather and combine illness experiences to produce interpretations of-and remedies for-their conditions that are not necessarily evidence-based [103]. These recommendations can sometimes contradict those offered by experts and the evidence, with concerns that, as use and comfort with Web 2.0 becomes more widespread, this will occur more frequently than at present [101,104]. In contrast to previous decades, where illness, particularly AOD uses, has been an intensely private experience, the Internet and Web 2.0 technologies are bringing about changes in this regard. We are seeing a relative decline in professional authority and increased demands from laypeople for medicalization (defining a problem in medical terms) or demedicalization of behavioural conditions such as AOD use problems [105,106]. Particularly for people who are reluctant or unable to access traditional treatments and health professionals within these settings, the Internet (Google, online forums, blogs) are often consulted for advice and treatment strategies, with little in the way of evidence to support the

advice and diagnoses provided. Advice can serve to heighten demands for treatment and anxiety around symptoms, increasing the demand for, potentially, unnecessarily and costly diagnostic procedures, placing additional pressures on services that are already operating at capacity. An added concern is that treatments, especially pharmacotherapy, is prescribed in an attempt to contain costs and other resources [80]. The converse could also result, in the case of addictions, whereby use could be normalized, decreasing motivation to change and for treatment. Debates about these issues are likely to have a significant impact on help-care reform, particularly in countries such as the USA [80]. Proponents of the use of Web 2.0 and associated technologies need to develop strategies to work with this phenomenon.

There are also obvious quality of information, confidentiality and technological safety concerns of using social networking sites for health purposes [107]. For instance, recent attempts to explore these variables among diabetes-specific social networking sites found much variability in the quality and technological safety of the most popular of these sites [108]. This is a concern, considering the high volume of use these sites attract and highlights an area in need of further development and improvement. Similarly, a qualitative evaluation of the content of communication in 15 Facebook communities dedicated to diabetes management support found users employed the site to share personal clinical information, to request disease-specific guidance and feedback, and to receive emotional support. However, promotional activity and personal data collection presented a concern [109]. Finally, Prochaska et al. [110] concluded that although current attempts to establish "quit smoking" Twitter accounts had been inconsistent and unsustainable, but that "Twitter and other social networking platforms offer tremendous and yet unrealised potential in engaging users who want to quit smoking" .

Conclusion

Sociologists are only just beginning to explore the impact and meaning of this phenomenon and what it means for health and illness.

Clinicians, researchers, and sociologists are only just beginning to understand and explore the impact of Web 2.0 applications, as a social influence tool, to a person's experience of chronic health problems. The ability of online social networks to offer round-the-clock access to vast numbers of people overcomes many of the problems involved with offline support (e.g., time, availability and geographical constraints). There are, however, some concerns raised regarding what impact this kind of lay-expertise may have on health at an individual and systemic level. Nevertheless, such interactions could alter motivation, assist in buffering stressors and enhancing coping skills [111]. In the education sector, the use of Web 2.0 technologies that expand interactivity and collaborative content sharing, such as Facebook, are being used to engage and motivate students to become more active learners [112-115]. The health sector is also beginning to explore the potential of these applications for improved health outcomes [59], with studies indicating that Facebook is already frequently used by patients, carers and healthcare professionals to share their experiences with one another [116].

Although in its infancy, there is growing evidence to suggest that social media can provide an engaging way of delivering interventions aimed at behavioural, cognitive and emotional modification [117]. The combination of personalization, interactivity, and engagement offered by Web 2.0 technologies suggests there is potential for social media to be used for more than merely socialising. The major role played by social factors in initiation, maintenance and escalation of AOD use

presents an opportunity for this potential to be realised. Despite this, with the exception of online forums which remain unevaluated, there have only been a few cases of Web 2.0 applications being used in the treatment of AOD use. Those that do exist have focused on smoking cessation [118-120]. For instance, an automated, Internet-based smoking cessation program was developed, and emulated a personal counselling experience using a variety of information materials and videos that were targeted at the individual user. After three months of online support, the cessation rate was 24% in the group that had online support, compared to 8% for the waitlist control [121].

Like any new tool, social networking cannot be considered a “silver bullet” to the challenges and complexity of an issue such as AOD use. Furthermore, the incorporation of such technology into current practice is not as simple as creating a website or a Facebook page or generating an online version of a treatment manual. There are both benefits and risks associated with the use of social media, which need to be explored. Significantly more controlled research is required, as this area represents an exciting new opportunity in the treatment of addiction.

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