Health Promotion International, Vol. 26 No. 2
doi:10.1093/heapro/daq062
Advance Access published 21 October, 2010

Intervening via chat: an opportunity for adolescents' mental health promotion?

RIK CRUTZEN* **and JASCHA DE NOOIJER**
CAPHRI, Maastricht University, The Netherlands
**Corresponding author. E-mail: rik.crutzen@maastrichtuniversity.nl*

SUMMARY

Mental health problems are highly prevalent among adolescents, but a majority of adolescents is reluctant to seek help at mental health services because of shame and lack of anonymity. Intervening via chat (i.e. offering online support) could be a solution to remove these barriers and to reach adolescents. The dimensions of the RE-AIM model (reach, efficacy, adoption, implementation and maintenance) served as a guiding principle for discussing the potential of offering online support via chat. It appeared that the use of chat may be an appropriate way to reach adolescents and may have a positive impact on outcome measures related to mental health. Additional efforts are needed to stimulate adoption at the individual level (target group, intermediaries) and the organizational level. Future research needs to focus on the dissemination of chat-based interventions, differences between online peer support and online professional support, and the content of conversations via chat about mental health problems.

Key words: chat; adolescents; mental health promotion; mental health problems

INTRODUCTION

Mental health problems are highly prevalent among adolescents: prevalence rates range from 19 to 28%, depending on socio-demographic characteristics and the used definition of mental health problems (e.g. behavioural problems, emotional problems) (Verhulst *et al.*, 1997; Wittchen *et al.*, 1998; Reijneveld *et al.*, 2005). These problems do not only impair current daily functioning (Wille *et al.*, 2008), but are also known to track into adulthood (Hofstra *et al.*, 2001) and lead to increased future health care costs (Scott *et al.*, 2001). Nevertheless, a majority of adolescents is reluctant to seek professional help at mental health services (e.g. because of shame, lack of anonymity) (Zwaanswijk *et al.*, 2003; Vanheusden *et al.*, 2008). Therefore, future developments in the field of mental health promotion should focus on removing barriers to seek help for mental health problems.

The omnipresence of the Internet in adolescents' daily lives resulted in the development of a new field referred to as 'e-mental health'. Mental health services are delivered online nowadays, because it is known that adolescents feel empowered to talk about sensitive topics in an online setting that provides a degree of anonymity (Gould *et al.*, 2002; Suzuki and Calzo, 2004). It is important that these e-mental health interventions fit in with adolescents' needs and use of the Internet (Crutzen *et al.*, 2009a; Crutzen *et al.*, 2008c). Therefore, intervening via chat (i.e. offering online support) could be a valuable opportunity, because ~90% of adolescents use the Internet to chat (Van Rooij *et al.*, 2009).

Offering online support is mostly used as indicated prevention, e.g. an intervention

targeted at high-risk individuals who are identified as having minimal but detectible signs or symptoms foreshadowing mental disorder, but who do not meet DSM-IV diagnostic levels at the current time (Mrazek and Haggerty, 1994). 'Master your mood', for example, is a group course aimed at adolescents with depressive complaints. The group course takes place in a closed chat room and is moderated by mental health professionals (Gerrits *et al.*, 2007). Whether or not to moderate chat sessions, whether moderation needs to be done by mental health professionals or by peers, and whether chat sessions are group-based or one-on-one are issues that need to be taken into account when developing these kinds of interventions.

The aim of this article is to discuss the issues regarding online support via chat as a means to adolescents' mental health promotion and to provide future directions for research and practice. Literature published after 2000 and identified via PubMed and PsycInfo will be discussed to reach this aim. A title and abstract search in these databases, using the keyword chat and limited to children and adolescents, resulted in 335 unique hits. The majority of these hits, however, was rejected because they did not deal with mental health promotion. The identified literature was used to look at the potential of online support via chat in a narrative review using a theoretical framework.

The RE-AIM model is a very useful framework to look at the potential of online support via chat. According to this model, the public health impact of an intervention can only be evaluated by the assessment of five dimensions: reach, efficacy (both positive and negative), adoption, implementation and maintenance (hence the acronym RE-AIM) (Glasgow *et al.*, 1999; Glasgow, 2007). The latter three dimensions relate to the individual level (e.g. adolescents) *and* the setting (e.g. mental health institutions). Each dimension is important for determining the eventual population-based impact of a new intervention technology (Glasgow, 2007). Therefore, these dimensions will serve as a guiding principle for discussing the potential of offering online support via chat. It was not intended to empirically test the appropriateness of the RE-AIM framework, but to conduct a narrative review of online support via chat according to the dimensions of the RE-AIM framework.

REACH

The first dimension to be assessed is whether it is possible to reach adolescents through the Internet. Recent figures show a worldwide usage acceleration of 380% between 2000 and 2009 (Internet World Stats, 2010b) and Internet penetration rates are the highest in western Europe, North America and Australia (Internet World Stats, 2010a). Moreover, the current generation of adolescents grew up with the Internet (Tapscott, 1998) and is more open towards new possibilities offered by this medium than today's adults (Leung, 2003; Roberts and Foehr, 2008). Furthermore, the number of adolescents' psychosocial risk factors is positively related to use of the Internet (Griffiths and Wood, 2000; Sun *et al.*, 2005; Campbell *et al.*, 2006) and chat (Beebe *et al.*, 2004; Anolli *et al.*, 2005). Therefore, if used properly, Internet-delivered interventions could effectively reach the high-risk populations. It needs to be stressed, however, that interventions need to be firmly connected to the target group they are outreaching. It has been recommended that this could be encouraged by means of a peer-based chat component (Hallett *et al.*, 2007), because members of the target group can highly identify themselves with peers.

EFFICACY

The second dimension to be assessed is the impact of chatting on outcome measures (e.g. well-being), including positive and potential negative impact. Although chat-based interventions may be feasible (Cantrell and Conte, 2008) and participants may be satisfied when using them, this does not necessarily result in a positive impact on outcome measures (Trautmann and Kröner-Herwig, 2008). There are, however, several examples of the use of chat in the context of an intervention having a positive impact on outcome measures, using the principles of cognitive behavioural therapy that have proved to be effective in offline settings (Zabinski *et al.*, 2004; Gerrits *et al.*, 2007). Chat sessions led by mental health professionals, for example, resulted in a reduction of adolescents' depressive complaints (Gerrits *et al.*, 2007). Another example, focusing on eating disorder prevention, showed that even a 1-hour moderated chat session about body image and eating

significantly reduced eating pathology and improved self-esteem (Zabinski *et al.*, 2001, 2004). A previous study on chatting in a public chat room outside the context of an intervention website, however, showed that there was no effect on adolescents' well-being (Valkenburg and Peter, 2007). All these examples used group chat sessions (instead of one-on-one sessions), although equal participation was stimulated [e.g. by directing questions to specific participants (Zabinski *et al.*, 2004)]. Potential negative impact can also result from group interactions in a chat room. Group interactions about anti-drug advertisements, for example, led to pro-marijuana attitudes and subjective normative beliefs, which may result in deleterious effects (David *et al.*, 2006). Furthermore, longer-term results are hardly reported; neither negative nor positive (Woodruff *et al.*, 2007). Therefore, it remains important to assess the impact of chat-based interventions on clearly defined outcome measures relevant to the intervention's topic, to use chat in the context of an intervention, and to assess differences in impact between group chat sessions and one-on-one sessions.

ADOPTION

The third dimension to be assessed is whether the target group (i.e. adolescents) and possible intermediaries (e.g. mental health professionals) are willing to use a chat-based intervention. Previous research indicated that there is a need among adolescents for online help related to mental health problems (Havas *et al.*, in press). Moreover, the use of chat by adolescents was not related to shyness or anxiety, suggesting that shyness or anxiety does not pose an obstacle to chat-based interventions and is even advantageous (Scealy *et al.*, 2002). It is argued, for example, that adolescents who are socially fearful may be using chat as a form of low-risk social approach and an opportunity to rehearse social behaviour and communication skills (Campbell *et al.*, 2006). Therefore, chat rooms can be utilized by school and child-clinical psychologists to identify adolescents who may be experiencing social difficulties (Heitner, 2003). An interesting case study aimed at stimulating adoption of a chat room by the target group is the CyberReach project in Perth, Western Australia. In this project, peer-based health promotion outreach was stimulated by means of training and supervision frameworks that were effective *and* supported by the target group (Hallett *et al.*, 2007). This demonstrates that additional efforts are needed to stimulate adoption of chat-based interventions by the target group and possible intermediaries. Availability of these intermediaries, however, is not self-evident (due to limited logistical or financial resources) and can influence the adoption of chat-based interventions at the organizational level (Paulussen *et al.*, 2007).

IMPLEMENTATION

The fourth dimension to be assessed is how to ensure proper intervention delivery. The key figure in intervention delivery is the chat moderator. Previous studies demonstrated, for example, that a moderated chat resulted in less negative remarks about a racial or ethnic group (Tynes *et al.*, 2004), less explicit sexuality and fewer obscenities (Subrahmanyam *et al.*, 2006) in comparison with a non-moderated chat. These differences with non-moderated chat, however, were not only attributable to the moderating process, but also to the differences in populations attracted. A moderated chat attracted more adolescents that self-identified as younger and female in comparison with a non-moderated chat (Subrahmanyam *et al.*, 2006). Adolescents, however, are inclined to introduce themselves differently while chatting (Bayraktar and Gun, 2007). The most important motives for such identity experiments are self-exploration (e.g. to investigate how others react), social compensation (e.g. to overcome shyness) and social facilitation (e.g. to facilitate relationship formation) (Gross, 2004; Valkenburg *et al.*, 2005). Hence, these identity experiments could serve as a purpose on their own. It should be noted, however, that these identity experiments were observed outside the context of an intervention website. It remains unclear to what extent they also occur in moderated chat sessions related to mental health problems.

Not only the presence of a chat moderator, but also the used communication style influences the target group's experience (Van Dolen *et al.*, 2007). Therefore, the moderator should be familiar with the communication style of the intervention's target group. For example, while Swiss dialects used to appear rarely in written

form, the proportion of dialectal contributions can be as high as 90% in Swiss chat rooms. Furthermore, especially in socio-emotional contexts, participants used more emoticons in comparison with task-oriented contexts (Derks *et al.*, 2007). In general, deep, smooth conversations are most helpful in online support, which is comparable to offline settings (Barak and Bloch, 2006).

MAINTENANCE

The final dimension to be assessed is how to promote chat-based interventions to become institutionalized or part of the routine organizational practices and policies. To our knowledge, there are no studies to date that specifically focus on this dimension. It is acknowledged, however, that constant technological up-skilling of mental health professionals may be required (Hallett *et al.*, 2007) as is an increase in their perceived advantages of offering online support via chat (Centore and Milacci, 2008). Furthermore, the connection to adolescents can be enhanced by extending ways and times when mental health professionals are available (Skinner *et al.*, 2003). Offering online support via chat has the potential to enhance the connection to adolescents.

FUTURE DIRECTIONS

This overview demonstrates that the use of chat may be an appropriate way to reach adolescents and may have a positive impact (in the context of an intervention) on outcome measures related to mental health. Nevertheless, additional efforts are needed to stimulate adoption at the individual level (target group, intermediaries) and the organizational level. Additionally, mental health professionals need to acquire technological skills and skills related to communication style. If these conditions are met, then offering online support via chat can have a large public health impact. There are, however, four issues that were not or only limitedly discussed and need further attention in future research.

First of all, the dissemination of chat-based interventions needs more attention. Successful dissemination of a chat-based intervention is required before adolescents can use it (Crutzen *et al.*, 2008a). Successful dissemination depends on (1) the target population, (2) the source and (3) the intervention itself (Rogers, 2003), and should ultimately result in adoption of the intervention. Although the CyberReach project in Perth, Western Australia is an interesting case study, future research needs to aim at gaining more evidence-based insight into stimulating mental health promotion outreach by means of training and supervision frameworks [e.g. by using a buddy system to disseminate chat-based interventions or other online word of mouth strategies (Crutzen *et al.*, 2009b)].

Second, the differences between online peer support and online professional support need to be studied in detail. Although both forms of support can be advantageous from a public health point of view, it remains unclear whether these forms of support attract different adolescents (e.g. in terms of socio-demographics or the nature of mental health problems). It is imaginable, for example, that online peer support is used by adolescents who perceive their problems as less severe or who are more reluctant to seek professional help for their mental health problems. Moreover, online peer support could also serve as a gateway to online professional support. This gateway principle is, for example, also applied in an Internet-based HIV-prevention program that uses virtual pursers on a popular e-dating website to invite users to the intervention website (Kok *et al.*, 2006).

Third, the potential for abuse in chat-based interventions receives minor attention in the current literature. Users, for example, are not necessarily adolescents seeking support for their mental health problems, but they can also use these interventions to fool around or to have fun. Moderation may be a solution to this problem, because moderation can have an impact on the conversations in chat-based interventions (Tynes *et al.*, 2004; Subrahmanyam *et al.*, 2006). The use of moderators, however, requires resources (e.g. availability, skills) that may be limited. Another issue with regard to abuse is data protection. An example of a Dutch initiative that deals with this issue is the Dutch Data Protection Authority. Projects can be registered at this authority, which supervises the fair and lawful use and security of personal data (Crutzen *et al.*, 2008b).

Finally, the content of conversations via chat about mental health problems has not been thoroughly investigated. The dimensions of efficacy (i.e. impact on outcome measures) and implementation (i.e. intervention delivery) would both benefit from more detailed insight into the content of conversations, which could serve as a handle for further improvement in terms of efficacy and implementation. It is imaginable, for example, that there are important differences in chat conversations with mental health professionals or with peers. This could be studied by means of content analysis of anonymous log files of chat conversations (Keelan *et al.*, 2007; Jenssen *et al.*, 2009).

So, although more evidence-based insight into several aspects of online support via chat is needed, it has a large potential public health impact in the field of adolescents' mental health promotion. Future research should focus on the aspects mentioned above (dissemination, differences between online peer and professional support, abuse, and content of conversations) to fully utilize the opportunities of chat as a means to mental health promotion and therewith reduce future prevalence rates of mental health problems and the following mental disorders.

REFERENCES

Anolli, L., Villani, D. and Riva, G. (2005) Personality of people using chat: an on-line research. *Cyberpsychology & Behavior*, **8**, 89–95.

Barak, A. and Bloch, N. (2006) Factors related to perceived helpfulness in supporting highly distressed individuals through an online support chat. *Cyberpsychology & Behavior*, **9**, 60–68.

Bayraktar, F. and Gun, Z. (2007) Incidence and correlates of Internet usage among adolescents in North Cyprus. *Cyberpsychology & Behavior*, **10**, 191–197.

Beebe, T. J., Asche, S. E., Harrison, P. A. and Quinlan, K. B. (2004) Heightened vulnerability and increased risk-taking among adolescent chat room users: results from a statewide school survey. *Journal of Adolescent Health*, **35**, 116–123.

Campbell, A. J., Cumming, S. R. and Hughes, I. (2006) Internet use by the socially fearful: addiction or therapy? *Cyberpsychology & Behavior*, **9**, 69–81.

Cantrell, M. A. and Conte, T. (2008) Enhancing hope among early female survivors of childhood cancer via the Internet: a feasibility study. *Cancer Nursing*, **31**, 370–379.

Centore, A. J. and Milacci, F. (2008) A study of mental health counselors' use of and perspectives on distance counseling. *Journal of Mental Health Counseling*, **30**, 267–282.

Crutzen, R., De Nooijer, J., Brouwer, W., Oenema, A., Brug, J. and De Vries, N. K. (2008a) Internet-delivered interventions aimed at adolescents: a Delphi study on dissemination and exposure. *Health Education Research*, **23**, 427–439.

Crutzen, R., De Nooijer, J., Candel, M. J. J. M. and De Vries, N. K. (2008b) Adolescents who intend to change multiple health behaviours choose greater exposure to an Internet-delivered intervention. *Journal of Health Psychology*, **13**, 906–911.

Crutzen, R., De Nooijer, J. and De Nries, N. K. (2008c) How to reach a target group with Internet-delivered interventions? *The European Health Psychologist*, **10**, 77–79.

Crutzen, R., De Nooijer, J., Brouwer, W., Oenema, A., Brug, J. and De Vries, N. K. (2009a) A conceptual framework for understanding and improving adolescents' exposure to Internet-delivered interventions. *Health Promotion International*, **24**, 277–284.

Crutzen, R., De Nooijer, J., Brouwer, W., Oenema, A., Brug, J. and De Vries, N. K. (2009b) Effectiveness of online word of mouth on exposure to an Internet-delivered intervention. *Psychology & Health*, **24**, 651–661.

David, C., Cappella, J. N. and Fishbein, M. (2006) The social diffusion of influence among adolescents: group interaction in a chat room environment about antidrug advertisements. *Communication Theory*, **16**, 118–140.

Derks, D., Bos, A. E. R. and von Grumbkow, J. (2007) Emoticons and social interaction on the Internet: the importance of social context. *Computers in Human Behavior*, **23**, 842–849.

Gerrits, R. S., Van der Zanden, R. A. P., Visscher, R. F. M. and Conijn, B. P. (2007) Master your mood online: A preventive chat group intervention for adolescents. *Australian e-Journal for the Advancement of Mental Health*, **6**, e1–e11.

Glasgow, R. E. (2007) eHealth evaluation and dissemination research. *American Journal of Preventive Medicine*, **32**, S119–S126.

Glasgow, R. E., Vogt, T. M. and Boles, S. M. (1999) Evaluating the public health impact of health promotion interventions: the RE-AIM framework. *American Journal of Public Health*, **89**, 1322–1327.

Gould, M. S., Munfakh, J. L., Lubell, K., Kleinman, M. and Parker, S. (2002) Seeking help from the Internet during adolescence. *Journal of the American Academy of Child & Adolescent Psychiatry*, **41**, 1182–1189.

Griffiths, M. and Wood, R. T. A. (2000) Risk factors in adolescence: the case of gambling, videogame playing, and the Internet. *Journal of Gambling Studies*, **16**, 199–225.

Gross, E. F. (2004) Adolescent Internet use: what we expect, what teens report. *Journal of Applied Developmental Psychology*, **25**, 633–649.

Hallett, J., Brown, G., Maycock, B. and Langdon, P. (2007) Changing communities, changing spaces: the challenges of health promotion outreach in cyberspace. *Promotion & Education*, **14**, 150–154.

Havas, J., De Nooijer, J., Crutzen, R. and Feron, F. (in press) Adolescents' view about an Internet platform for adolescents with mental health problems. *Health Education*.

Heitner, E. I. (2003) *The Relationship Between use of the Internet and Social Development in Adolescence,* Vol. 63. ProQuest Information & Learning, USA.

Hofstra, M. B., Van der Ende, J. and Verhulst, F. C. (2001) Adolescents' self-reported problems as predictors of psychopathology in adulthood: 10-year follow-up study. *The British Journal of Psychiatry*, **179**, 203–209.

Internet World Stats (2010a) *Countries with Highest Internet Penetration Rates*. http://www.internetworldstats.com/top25.htm (last accessed 2 March 2010).

Internet World Stats (2010b) *Internet Usage Statistics: The Internet Big Picture*. http://www.internetworldstats.com/stats.htm (last accessed 2 March 2010).

Jenssen, B. P., Klein, J. D., Salazar, L. F., Daluga, N. A. and DiClemente, R. J. (2009) Exposure to tobacco on the Internet: content analysis of adolescents' Internet use. *Pediatrics*, **124**, e180–e186.

Keelan, J., Pavri-Garcia, V., Tomlinson, G. and Wilson, K. (2007) YouTube as a source of information on immunization: a content analysis. *JAMA*, **298**, 2482–2484.

Kok, G., Harterink, P., Vriens, P., De Zwart, O. and Hospers, H. J. (2006) The Gay Cruise: developing a theory- and evidence-based Internet HIV-prevention intervention. *Sexuality Research & Social Policy*, **3**, 52–67.

Leung, L. (2003) Impacts of Net-generation attributes, seductive properties of the Internet, and gratifications-obtained on Internet use. *Telematics and Informatics*, **20**, 107–129.

Mrazek, P. J. and Haggerty, R. J. (1994) New directions in definitions. In Mrazek, P. J. and Haggerty, R. J. (eds), *Reducing Risks for Mental Disorders: Frontiers for Preventive Intervention Research*. National Academy Press, Washington.

Paulussen, T., Wiefferink, K. and Mesters, I. (2007) Invoering van effectief gebleken interventies [Adoption of proven to be effective interventions]. In Brug, J., Van Assema, P. and Lechner, L. (eds), *Gezondheidsvoorlichting en gedragsverandering: een planmatige aanpak*. Van Gorcum, Assen.

Reijneveld, S. A., Brugman, E., Verhulst, F. C. and Verloove-Vanhorick, S. P. (2005) Area deprivation and child psychosocial problems: a national cross-sectional study among school-aged children. *Social Psychiatry and Psychiatric Epidemiology*, **40**, 18–23.

Roberts, D. F. and Foehr, U. G. (2008) Trends in media use. *The Future of Children*, **18**, 11–37.

Rogers, E. M. (2003) *Diffusion of Innovations*. The Free Press, New York.

Scealy, M., Phillips, J. G. and Stevenson, R. (2002) Shyness and anxiety as predictors of patterns of Internet usage. *Cyberpsychology & Behavior*, **5**, 507–515.

Scott, S., Knapp, M., Henderson, J. and Maughan, B. (2001) Financial cost of social exclusion: follow up study of antisocial children into adulthood. *BMJ*, **323**, 191.

Skinner, H., Biscope, S., Poland, B. and Goldberg, E. (2003) How adolescents use technology for health information: implications for health professionals from focus group studies. *Journal of Medical Internet Research*, **5**, e32.

Subrahmanyam, K., Smahel, D. and Greenfield, P. (2006) Connecting developmental constructions to the Internet: identity presentation and sexual exploration in online teen chat rooms. *Developmental Psychology*, **42**, 395–406.

Sun, P., Unger, J. B., Palmer, P. H., Gallaher, P., Chou, C. P., Baezconde-Garbanati, L. *et al.* (2005) Internet accessibility and usage among urban adolescents in Southern California: implications for web-based health research. *Cyberpsychology & Behavior*, **8**, 441–453.

Suzuki, L. K. and Calzo, J. P. (2004) The search for peer advice in cyberspace: an examination of online teen bulletin boards about health and sexuality. *Journal of Applied Developmental Psychology*, **25**, 685–698.

Tapscott, D. (1998) *Growing Up Digital: The Rise of the Net Generation*. McGraw-Hill, New York.

Trautmann, E. and Kröner-Herwig, B. (2008) Internet-based self-help training for children and adolescents with recurrent headache: a pilot study. *Behavioural and Cognitive Psychotherapy*, **36**, 241–245.

Tynes, B., Reynolds, L. and Greenfield, P. M. (2004) Adolescence, race, and ethnicity on the Internet: a comparison of discourse in monitored vs. unmonitored chat rooms. *Journal of Applied Developmental Psychology*, **25**, 667–684.

Valkenburg, P. M. and Peter, J. (2007) Online communication and adolescent well-being: testing the stimulation versus the displacement hypothesis. *Journal of Computer-Mediated Communication*, **12**, 1169–1182.

Valkenburg, P. M., Schouten, A. P. and Peter, J. (2005) Adolescents' identity experiments on the Internet. *New Media & Society*, **7**, 383–402.

Van Dolen, W. M., Dabholkar, P. A. and De Ruyter, K. (2007) Satisfaction with online commercial group chat: the influence of perceived technology attributes, chat group characteristics, and advisor communication style. *Journal of Retailing*, **83**, 339–358.

Van Rooij, A. J., Schoenmakers, T. M., Meerkerk, G.-J. and Van de Mheen, D. (2009) *Wat doen jongeren op internet en hoe verslavend is dit? [What are Young People Doing on the Internet and How Addictive is This?]*. IVO, Rotterdam.

Vanheusden, K., Mulder, C. L., Van der Ende, J., Van Lenthe, F. J., Mackenbach, J. P. and Verhulst, F. C. (2008) Young adults face major barriers to seek in help from mental health services. *Patient Education and Counseling*, **73**, 97–104.

Verhulst, F. C., Van der Ende, J., Ferdinand, R. F. and Kasius, M. C. (1997) The prevalence of DSM-III-R diagnoses in a national sample of Dutch adolescents. *Archives of General Psychiatry*, **54**, 329–336.

Wille, N., Bettge, S., Wittchen, H. U. and Ravens-Sieberer, U. (2008) How impaired are children and adolescents by mental health problems? Results of the BELLA study. *European Child & Adolescent Psychiatry*, **17**, 42–51.

Wittchen, H. U., Nelson, C. B. and Lachner, G. (1998) Prevalence of mental disorder and psychosocial impairments in adolescents and young adults. *Psychological Medicine*, **28**, 109–126.

Woodruff, S. I., Conway, T. L., Edwards, C. C., Elliott, S. P. and Crittenden, J. (2007) Evaluation of an Internet virtual world chat room for adolescent smoking cessation. *Addictive Behaviors*, **32**, 1769–1786.

Zabinski, M. F., Wilfley, D. E., Pung, M. A., Winzelberg, A. J., Eldredge, K. and Taylor, C. B. (2001) An interactive Internet-based intervention for women at risk of eating disorders: a pilot study. *International Journal of Eating Disorders*, **30**, 129–137.

Zabinski, M. F., Wilfley, D. E., Calfas, K. J., Winzelberg, A. J. and Taylor, C. B. (2004) An interactive psychoeducational intervention for women at risk of developing an eating disorder. *Journal of Consulting and Clinical Psychology*, **72**, 914–919.

Zwaanswijk, M., Van der Ende, J., Verhaak, P. F., Bensing, J. M. and Verhulst, F.C. (2003) Factors associated with adolescent mental health service need and utilization. *Journal of the American Academy of Child & Adolescent Psychiatry*, **42**, 692–700.