Cognitive Behaviour Therapy

Establishing Guidelines for Executing and Reporting Internet Intervention Research

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Establishing Guidelines for Executing and Reporting Internet Intervention Research

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Abstract. The field of Internet interventions is growing rapidly. New programs are continually being developed to facilitate health and mental health promotion, disease and emotional distress prevention, risk factor management, treatment, and relapse prevention. However, a clear definition of Internet interventions, guidelines for research, and evidence of effectiveness have been slower to follow. This article focuses on the quality standardization of research on Internet-delivered psychological and behavioural interventions. Although the science underpinning Internet interventions is just starting to be established, across research studies there are often conceptual and methodological difficulties. The authors argue that this situation is due to the lack of universally accepted operational guidelines and evaluation methods. Following a critical appraisal of existing codes of conduct and guidelines for Internet-assisted psychological and health interventions, the authors developed a framework of guidelines for Internet intervention research utilizing aspects of facet theory (Guttman & Greenbaum, 1998). The framework of facets, elements, and guidelines of best practice in reporting Internet intervention research was then sent to several leading researchers in the field for their comment and input, so that a consensus framework could be agreed on. The authors outline 12 key facets to be considered when evaluating and reporting Internet intervention studies. Each facet consists of a range of recommended elements, designed as the minimum features for reporting Internet intervention studies. The authors propose that this framework be utilized when designing and reporting Internet intervention research, so results across studies can be replicated, extended, compared, and contrasted with greater ease and clarity. *Key words: Internet interventions; research; evaluation; guidelines; reporting criteria.*

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The health and mental health fields have lagged behind other fields in the use of interactive communication technologies, but e-health in general and Internet-assisted psychological and medical services in particular have been growing rapidly in recent years. The Internet

offers a variety of multimedia interactivity and connectivity formats, with tailoring to specific needs and interests of individual users. Online applications are ideal for use within the helping professions because they allow for the dissemination of standardized yet personalised treatments; they can be used 24 hours per day, 7 days a week, without affecting efficiency; they avoid the need for waiting lists; they allow privacy and consistency of care; and symptom monitoring and outcome measures can be built in relatively easily (Andersson, 2009; Andrews, Cuijpers, Craske, McEvoy, & Titov, 2010; Cuipers et al., 2009; National Institute of Clinical Excellence, 2004). Consequently, new Internet-based interventions for psychological and behavioural health problems are appearing at an increasing rate. These interventions include interactive therapy programs that provide highly specialized treatment and feedback tailored to the characteristics of the user, delivered with and without guidance from a human therapist; "expert systems" in which assessment and therapeutic techniques based on decision rules and behaviour change strategies are integrated; and education programs, digitized information, and online therapeutic communication services such as online counseling, online discussion and support groups, and "ask an expert" websites (Barak, Klein, & Proudfoot, 2009).

For users, the advantages of online psychological interventions include the anonymity and invisibility that some programs afford (with associated reduction in attributed stigma); the accessibility to treatments for those restricted by geographical, transport, personal disability, or financial barriers; the availability of treatment or support at any time; consumer empowerment regarding managing one's own health care; and the flexibility of use in terms of self-determined pace and opportunity to review the material as often as desired. These advantages have created growing interest in the use of online interventions (Andersson, 2009, Andrews et al., 2010; Mohr et al., 2010). Until recently, the evidence base for the usability, clinical efficacy, and cost-effectiveness of online interventions was limited; hence, comparison of web-based behavioural and mental health programs was difficult to pursue. However, more recently, there has been an increase in the number and nature of methodologically sound studies examining such interventions. Most of these studies have

demonstrated positive outcomes for a variety of psychological and behavioural health issues, such as depressive symptoms/depression (Andersson et al., 2005; Christensen, Griffiths, & Jorm, 2004; Clarke et al., 2005; Robertson, Smith, Castle, & Tannenbaum, 2006; Ruwaard et al., 2009; Spek et al., 2007; Titov et al., 2010; Vernmark et al., 2010), panic disorder (Carlbring, Westling, Ljungstrand, Ekselius & Andersson, 2001; Klein & Richards, 2001; Klein, Austin, et al., 2009; Klein, Richards, & Austin, 2006; Pier et al., 2008; Ruwaard, Broeksteeg, Schrieken, Emmelkamp, & Lange, 2010; Schneider, Mataix-Cols, Marks, & Bachofen, 2003), social anxiety disorder (Andersson et al., 2006; Carlbring, Gunnarsdóttir, et al., 2007; Titov, Andrews, Choi, Schwenke, & Mahoney, 2008; Titov, Andrews, & Schwencke, 2008), posttraumatic stress symptoms/disorder (Klein, Mitchell, et al., 2009; Klein et al., 2010; Lange & Ruwaard, 2010; Lange et al., 2003), anxiety prevention (Bennett, Reynolds, Christensen, & Griffiths, 2010; Christensen, Griffiths, et al., 2010; Kenardy, McCafferty, & Rosa, 2003), work-related stress (Ruwaard, Lange, Bouwman, Broeksteeg, & Schrieken, 2007), eating disorders/weight problems (Ljótsson, Mitsell, Lundin, Carlbring, & Ghaderi, 2007; Tate, Jackvony, & Wing, 2006; Winzelberg et al., 2000), encopresis (Ritterband et al., 2003), smoking (Swartz, Noell, Schroeder, & Ary, 2006), insomnia (Ritterband, Thorndike, Gonder-Frederick, et al., 2009; Ström, Pettersson, & Andersson, 2004), physical health conditions (Kuhl, Sears, & Conti, 2006; Ljósson et al., 2011; Stinson, Wilson, Gill, Yamada, & Holt, 2009), well-being (Mitchell, Stanimirovic, Klein, & Vella-Brodrick, 2009), and resilience (Abbott, Klein, Hamilton, & Rosenthal, 2009) to name a few. A number of reviews have also been carried out, with results demonstrating feasibility and efficacy (e.g. Andersson & Cuijpers, 2009; Andersson, Ljótsson, & Weise, 2011; Cavanagh & Shapiro, 2004; Griffiths, Farrer, & Christensen, 2010; Macea, Gajos, Calil, & Fregni, 2010; Myung, McDonnell, Kazinets, Seo, & Moskowitz, 2009; Neve, Morgan, Jones, & Collins, 2010; Reger & Gahm, 2009; Rooke, Thorsteinsson, Karpin, Copeland, & Allsop, 2010; Spek et al., 2007; Tait & Christensen, 2010; van't Hof, Cuijpers, & Stein, 2009; White et al., 2010), as well as a comprehensive meta-analysis across 92 published studies (Barak, Hen, Boniel-Nissim,

& Shapira, 2008), which also showed highly positive results.

Despite the recent growth in research, much heterogeneity remains between the studies, limiting the comparisons able to be drawn and thus confounding interpretation. In addition, the literature is still in development in terms of the science underpinning the programs (Barak et al., 2009; Ritterband & Tate, 2009), and across research studies there are methodological difficulties such as a lack of common terminology and definitions, selection biases, inappropriate research designs, study attrition, and questionable conclusions drawn from the findings (Danaher & Seeley, 2009). We argue that these difficulties are, in part, due to a lack of a set of universally accepted research guidelines because of the comparative newness of the field. Existing quality standards for Internet-delivered psychological and health interventions, as reviewed below, are insufficient for guiding research. Thus, we outline a framework of guidelines specifically tailored to the components, science, and quality of Internet intervention research. We aim at the construction of a comprehensive framework of guidelines so that they are relevant for a wide scope of online interventions, across communication modality, population, nature of distress, type of intervention, and the other important delivery characteristics.

Existing quality standards

Although consumers have increasingly sought Internet-based psychological and health-related information and care services over the last decade, the quality of such information is variable and largely unregulated and has frequently been questioned (e.g. Bremner, Quinn, Quinn, & Veledar, 2006; Childs, 2005; Risk & Dzenowagis, 2001). In response to concerns about incomplete, misleading, inaccurate, or dangerous online mental and physical health information and practices, two major approaches have arisen in an attempt to guide developers/researchers of health websites and to assist consumers in identifying information resources of good quality.

The first approach has involved the development of principles or codes of conduct to guide creators of health information to produce good-quality websites (e.g. American Medical Association, n.d.; European Union eHealth, 2010; Rippen & Risk, 2000). Certain organizations, such as the Health on the Net Foundation (1997) have augmented their codes of conduct by certifying websites that comply with their codes. Additionally, websites could apply for third-party accreditation such as TRUSTe (n.d.) for a fee or, alternatively, seek inclusion in a "quality filtered" database or portal, for example, Organising Medical Networked Information (OMNI, n.d.), evaluated by a third party.

A second, parallel approach relating to the delivery of online therapeutic services has focused on the development of ethical standards of conduct (but not research per se) by various professional associations (e.g. American Counseling Association, 2005; Australian Psychological Society, 2011) or specialist societies (e.g. International Society for Mental Health Online, 2000). Here, members are encouraged to follow standards set by their particular professional society when incorporating web-based technology into their work, encompassing such issues as informed consent, confidentiality, research using the Internet, record keeping, and managing professional boundaries when using the web. In addition, several articles have been published discussing best practices and ethical and legal considerations for e-therapy (Abbott, Klein, & Ciechomki, 2008; Dever Fitzgerald, Hunter, Hadjistavropoulos, & Koocher, 2010; Whitehead & Proudfoot, 2010), as well as Beacon (n.d.; www.beacon.anu.edu.au) which is an online portal providing quality ratings of health websites (Christensen, Murray, et al., 2010).

We believe that the existing codes of conduct and standards of web content quality are important scientific resources for guiding intervention practice, but are insufficient as professional standards to guide Internet intervention research activities. Similarly, reports of efficacy, which are common in other research guidelines, are necessary but not sufficient when reporting Internet intervention research. To this end, we developed a set of best-practice guidelines, specifically for Internet interventions, to assist researchers who work in this field.
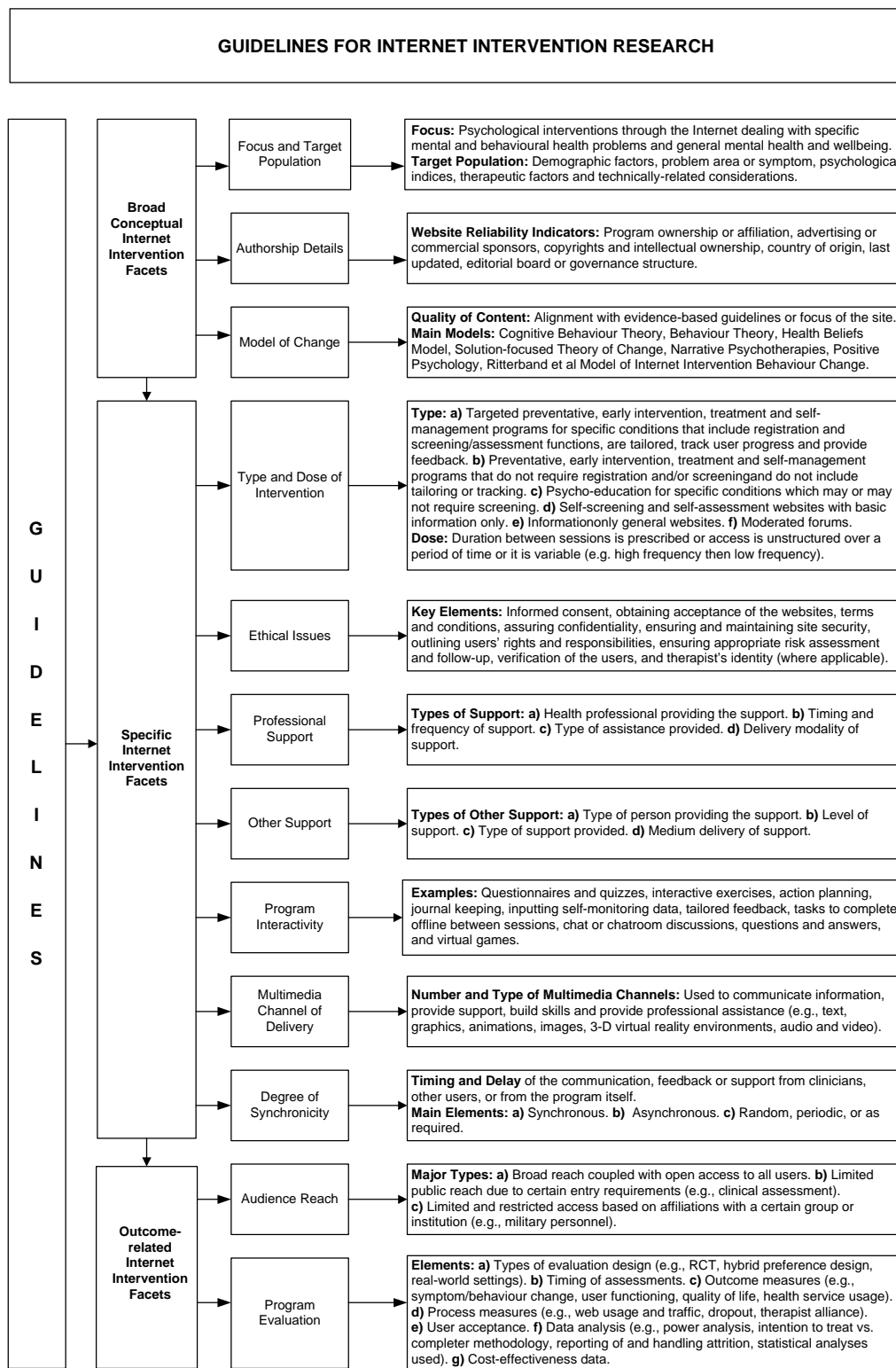
GUIDELINES FOR INTERNET INTERVENTION RESEARCH

GUIDELINES

Broad Conceptual Internet Intervention Facets

Focus and Target Population
Focus: Psychological interventions through the Internet dealing with specific mental and behavioural health problems and general mental health and wellbeing.
Target Population: Demographic factors, problem area or symptom, psychological indices, therapeutic factors and technically-related considerations.

Authorship Details
Website Reliability Indicators: Program ownership or affiliation, advertising or commercial sponsors, copyrights and intellectual ownership, country of origin, last updated, editorial board or governance structure.

Model of Change
Quality of Content: Alignment with evidence-based guidelines or focus of the site.
Main Models: Cognitive Behaviour Theory, Behaviour Theory, Health Beliefs Model, Solution-focused Theory of Change, Narrative Psychotherapies, Positive Psychology, Ritterband et al Model of Internet Intervention Behaviour Change.

Specific Internet Intervention Facets

Type and Dose of Intervention
Type: a) Targeted preventative, early intervention, treatment and self-management programs for specific conditions that include registration and screening/assessment functions, are tailored, track user progress and provide feedback. **b)** Preventative, early intervention, treatment and self-management programs that do not require registration and/or screening and do not include tailoring or tracking. **c)** Psycho-education for specific conditions which may or may not require screening. **d)** Self-screening and self-assessment websites with basic information only. **e)** Informationonly general websites. **f)** Moderated forums.
Dose: Duration between sessions is prescribed or access is unstructured over a period of time or it is variable (e.g. high frequency then low frequency).

Ethical Issues
Key Elements: Informed consent, obtaining acceptance of the websites, terms and conditions, assuring confidentiality, ensuring and maintaining site security, outlining users' rights and responsibilities, ensuring appropriate risk assessment and follow-up, verification of the users, and therapist's identity (where applicable).

Professional Support
Types of Support: a) Health professional providing the support. **b)** Timing and frequency of support. **c)** Type of assistance provided. **d)** Delivery modality of support.

Other Support
Types of Other Support: a) Type of person providing the support. **b)** Level of support. **c)** Type of support provided. **d)** Medium delivery of support.

Program Interactivity
Examples: Questionnaires and quizzes, interactive exercises, action planning, journal keeping, inputting self-monitoring data, tailored feedback, tasks to complete offline between sessions, chat or chatroom discussions, questions and answers, and virtual games.

Multimedia Channel of Delivery
Number and Type of Multimedia Channels: Used to communicate information, provide support, build skills and provide professional assistance (e.g., text, graphics, animations, images, 3-D virtual reality environments, audio and video).

Degree of Synchronicity
Timing and Delay of the communication, feedback or support from clinicians, other users, or from the program itself.
Main Elements: a) Synchronous. **b)** Asynchronous. **c)** Random, periodic, or as required.

Outcome-related Internet Intervention Facets

Audience Reach
Major Types: a) Broad reach coupled with open access to all users. **b)** Limited public reach due to certain entry requirements (e.g., clinical assessment). **c)** Limited and restricted access based on affiliations with a certain group or institution (e.g., military personnel).

Program Evaluation
Elements: a) Types of evaluation design (e.g., RCT, hybrid preference design, real-world settings). **b)** Timing of assessments. **c)** Outcome measures (e.g., symptom/behaviour change, user functioning, quality of life, health service usage). **d)** Process measures (e.g., web usage and traffic, dropout, therapist alliance). **e)** User acceptance. **f)** Data analysis (e.g., power analysis, intention to treat vs. completer methodology, reporting of and handling attrition, statistical analyses used). **g)** Cost-effectiveness data.

Figure 1. Guidelines for Internet intervention research.

Method

To establish the guidelines, we utilized aspects of facet theory (Guttman & Greenbaum, 1998), a systematic approach to conceptualizing and defining constructs to assist with theory construction and research design in the behavioural and social sciences. Facet theory provides a structure for defining the "universe of attributes" (in this case, within Internet intervention research) as well as the facets for which we argue that guidelines are needed. First, we outlined a "mapping sentence," a statement concerning the domain of Internet intervention research. The mapping sentence serves to define a priori exactly what is being studied: the population, the content variables, and the range of possible responses (Guttman & Greenbaum, 1998). Second, using an iterative approach based on empirical findings and research experience, we proposed a number of core "facets" (or necessary components) of reporting Internet intervention research. Third, we developed "elements" for each facet. Elements refer to the range of possible values (or response categories) that a facet contains. On the basis of this conceptualization, we derived guidelines of best practice for each facet, designed for executing and reporting Internet intervention research. The resultant multidimensional model—consisting of facets, elements, and guidelines—was then sent to several leading researchers in the field of Internet interventions for their critical comments and suggestions. The outcome of this process, the consensus framework of guidelines for Internet interventions, is outlined next and summarised in Figure 1.

Framework of guidelines for Internet intervention research

First, the mapping sentence is presented. It is followed by 12 facets, each with their constituent elements and a recommended guideline.

Mapping sentence: the domain of Internet intervention research

An Internet-based intervention is a self-guided or human-assisted program for health promotion, disease and emotional distress prevention, risk factor management, treatment, or relapse prevention that is executed by means of a prescriptive online intervention and/or communication operated through the Internet and used by consumers and patients seeking health- and mental health-related assistance. The program itself attempts to create positive change and/or enhance knowledge, awareness, and understanding via the provision of sound health-related material and use of web-based components, with or without support from health professionals or others (Barak et al., 2009). The scope of Internet interventions is broad and includes structured websites, chat, and Internet-enabled mobile phone applications. Internet intervention research consists of any formative or summative evaluation of an Internet intervention.

Facet 1: focus and target population

A range of different programs exists under the umbrella term "Internet interventions," including programs for specific mental health and behavioural health problems as well as those for general mental health and well-being. The target population may be defined in terms of demographic factors (e.g. age, gender, ethnic group, educational level), problem area or symptoms (e.g. insomnia, depression, anxiety, weight loss, diabetes), psychological indices (e.g. treatment history, learning style, self-efficacy, readiness for change, motivation, locus of control), therapeutic factors (e.g. time since diagnosis), and technologically related considerations (e.g. previous experience with computers).

Guideline. The primary focus of the Internet intervention is clearly displayed along with, if relevant, a diagnostic label, cutoff score on a reliable and valid assessment, structured diagnostic interview, or case formulation to identify the problem area or symptoms. A clear statement is also provided about the target group for the intervention, with age limits and other eligibility criteria.

Facet 2: authorship details

Authorship information, such as the identity of the program developers, their affiliation, copyrights and intellectual property ownership, whether there are advertising or commercial sponsors, the country of origin, last update, and the existence of an editorial board or governance structure, provides relevant indicators of the reliability and quality of an Internet intervention.

Guideline. The names, credentials, and affiliations of the program's developers are cited as well as the ownership and affiliation of the program. A link to further information is provided, such as whether and by whom the intervention is sponsored, date on which the program was developed or updated, and its country of origin.

Facet 3: model of change

Process variables or mediators, both specific and nonspecific, are most likely responsible for therapeutic change, although these variables have been continuously studied and are not fully clear (Walker et al., 2006). Specific process variables relate to the theoretical basis of the Internet intervention being evaluated, whereas nonspecific variables include common factors such as empathy for participants' distress, communication of hope for improvement, maintaining participants' motivation, and checking their understanding of and satisfaction with the program (Proudfoot et al., 2003). To date, the theories of therapeutic change relating to Internet interventions have been primarily derived from face-to-face interventions and include approaches such as cognitive behavioural theory (Beck, 1976; Ellis, 1994; Meichenbaum, 1985), behaviour therapy (Lazarus, 1997; Watson & Tharp, 2002), health beliefs model (Glanz, Rimer, & Lewis, 2002), social cognitive/learning theory (Bandura, 1997), transtheoretical model of behaviour change (Prochaska & DiClemente, 1986), solution-focused theory of change (Egan, 1998), narrative psychotherapies (White & Epston, 1990), and positive psychology (Seligman & Csikszentmihalyi, 2000). Recently, however, Ritterband, Thorndike, Cox and colleagues (2009) have proposed a holistic model of behaviour change and symptom improvement pertaining specifically to Internet interventions. Involving nine components, the model consists of (1) the user, influenced by (2) environmental factors that affect (3) website use and adherence, which are influenced by (4) support and (5) website characteristics. This leads to (6) behavior change and (7) symptom improvement through various (8) mechanisms of change, which are sustained via (9) treatment maintenance.
Guideline. The theory of change underpinning the intervention is clearly articulated when

discussing outcomes. Because Internet intervention research is still in its infancy, we believe it is premature at this stage to require researchers to demonstrate that the process of change was achieved by the intervention's hypothesized mechanism of action; however, we see the field evolving to this point in the future.

Facet 4: type and dose of intervention

Several types of Internet intervention exist, and the number continues to grow as technology develops and new electronic approaches are applied to psychological and behavioural problems. Types of Internet interventions include but are not limited to the following:

1. Targeted prevention, early intervention, treatment, and self-management programs for specific conditions that include registration and screening/assessment functions, are tailored to individual circumstances and are supported by a database that enables users (and, in some circumstances, clinicians) to track user progress and receive feedback. They may be offered in conjunction with professional or other assistance (see later discussion of Facet 6).
2. Prevention, early intervention, treatment, and self-management programs that do not require registration and/or screening and do not include tailoring to specific circumstances or tracking of progress. These are usually offered on a large scale to whole populations or at-risk sections of the public without professional or other support.
3. e-Counselling via various modalities (e.g. e-mail, text chat, audio chat, video chat).
4. Psycho-education for specific conditions that may or may not require screening.
5. Self-screening and self-assessment websites.
6. Moderated forums.

This facet also includes information about the duration between sessions. Some programs, for example, prescribe weekly sessions and others daily sessions, while still others do not stipulate a number of sessions but rather allow unstructured access over a period of time. Some are more variable, for example,

starting with high session frequency and moving to a less frequent schedule after a critical point.

Guideline. The type of the intervention is clearly stated, including its dose (the prescribed and actual number and frequency of sessions or modules undertaken by participants and/or the period of time over which the intervention is accessed), whether it is tailored to individual circumstances, and whether it allows users to track their progress and receive feedback. When assessments are used, it is stated whether they are validated for online administration.

Facet 5: ethical issues

Ethical issues associated with the use of Internet interventions include the provision of relevant information to allow individuals to make an informed decision about whether they want to use the intervention and take part in the study, obtaining acceptance regarding the website's "terms and conditions" or informed consent from those who do want to participate in the research, assuring their confidentiality, maintaining the security of the site or program, outlining users' rights and responsibilities, ensuring that appropriate risk assessment and follow-up procedures are an integral part of the research procedure, and establishing appropriate use for different samples (e.g. issues pertaining to the use by minors) (Whitehead & Proudfoot, 2010). Some potential participants (e.g. those with suicidal plans or histories of abuse) insist on full anonymity if they are to take part in the research, which can pose ethical dilemmas for researchers. Researchers have managed these situations by having participants consent to the terms and conditions without being required to register or provide any identifiable information. More generally, the use of unique user names and passwords, encryption methods, firewalls and back-up procedures, secured sites and transfer of confidential information, and verification of the participant's and therapist's identities (where applicable) and the therapist's credentials are important legal and safety elements.

Guideline. Researchers report the process of using the program, its potential risks and benefits, safeguards against the risks, procedures to follow in an emergency, and sources of help, especially when offering open-access anonymous online services where registration is not required. In the majority of cases where participants are required to register, they should use a unique user name and password to protect their privacy. Where the site is open access and anonymous, participants should consent to the terms and conditions of the service. The site, software, and data transmission are secure, and data are encrypted. A statement is included about how data are used and stored and when they will be destroyed. Users' rights and responsibilities are outlined as well as the program's liability. If e-mail or another procedure of synchronous or asynchronous communication is used that is not built into the system, participants are informed that it is not entirely secure. Researchers report their clinical trial registration and ethics approval number.

Facet 6: professional support

Professional support refers to the assistance provided by health professionals as an adjunct to the Internet intervention. Not all Internet interventions involve professional support, but when it is provided, elements include the following:

1. Health professional providing the support (e.g. clinical psychologist, psychiatrist, general practitioner, nurse, counselor, or specifically trained helper).
2. Timing and frequency of the support, including the way in which the communication is initiated (e.g. as needed, scheduled on a regular basis, only in response to patients' questions) and how the professional support is timed.
3. Type of assistance provided: assistance with intervention techniques, feedback about homework tasks, tracking progress, crisis management detection and assistance procedures, providing reminders/prompts, redirecting and reinforcing efforts, moderating bulletin board postings or forums, technical support.
4. Delivery modality of support: e-mail, forum, webcam, audio chat, telephone, SMS (texting), face-to-face support, closed message system requiring log-in by the therapist and the client.

Guideline. A statement is provided as to whether or not the Internet intervention is

delivered with professional support. For programs in which it is included, the following further details are specified: type and qualifications of health professional(s) providing the support, type of assistance offered, timing and frequency of the support, how it is initiated, and the medium by which the assistance is delivered.

Facet 7: other support
This facet refers to assistance provided by people other than health professionals. Similar to Facet 6, not all Internet interventions include other support, but when it is provided, four elements are involved:

1. Type of person providing support: for example, research assistant, technician, teacher, mentor, parent, participants' interaction with each other, "informed supporters" (expert patients who are successfully managing their condition).
2. Level of support: none, individually provided, group setting.
3. Type of support: providing information, offering practical advice and strategies, referring to additional help resources, sharing ideas, providing emotional help, following a therapeutic manual or template to assist participant's use of the intervention, technical support.
4. Medium of delivery of support: e-mail, forum, webcam chat, audio chat, telephone, face-to-face support, SMS (texting), chat room.

Guideline. Researchers report whether or not the Internet intervention includes support from someone other than a health professional. The type of person assisting and, where relevant, their qualifications are specified, together with the precise nature of their role, the type and availability of assistance offered, and whether it is anonymous as well as the medium of delivery. The supervisory arrangements should also be reported.

Facet 8: program interactivity
Program interactivity and feedback pertains to the dynamic computer-generated activity offered to users of an intervention and is a key feature of Internet interventions. Levels of interactivity are intentionally varied for the purposes of enhancing engagement, motivation, and adherence; increasing active rather than passive behaviour; tailoring content to individual users; increasing involvement in decision making; improving learning; increasing user control; and/or enhancing the impact of the intervention (Hawkins et al., 2010; Walther, Pingree, Hawkins, & Buller, 2005). Elements may include questionnaires and quizzes, interactive exercises, action planning, journaling, inputting self-monitoring data, tailored feedback, tasks to complete offline between sessions, chat or chat room discussions, questions and answers, and virtual games.

Guideline. The degree of user interactivity offered by the program is described by researchers, and examples are provided of component interactive features, together with their purpose and the amount of time a typical participant spends on the program (both its online and offline components).

Facet 9: multimedia channel of delivery
Interventions vary according to the number and type of multimedia channels used to communicate information, provide support, build skills, and provide additional assistance. Text, graphics, animations, images, 3-D virtual reality environments, audio, and video are currently used. For example, an intervention may include text and graphics to communicate information, audio instructions for progressive relaxation, video presenting case studies, as well as e-mail support from a therapist and/or the use of automated e-mail or SMS reminders. Graphics and animations may be interactive. Different channels may be chosen to align with intended users' characteristics, degree of distress, e-health literacy, treatment readiness, learning style, motivation, and self-efficacy as well as practical considerations. They are also used to enhance user engagement in the intervention.

Guideline. The communication delivery channels used in the intervention are fully described and explained.

Facet 10: degree of synchronicity
This facet refers to the timing and delay of the communication, feedback, or support from clinicians, from other users, or from the program itself. The facet pertains to all communication channels included in the program, because degree of communication synchronicity might be a principal research (Paulus & Phipps, 2008) or intervention

(Cress, Kimmerle, & Hesse, 2009; Pullen & Snow, 2007) value. The facet includes the following elements:

1. Synchronous: communication or support is immediate (e.g. real-time chat).
2. Asynchronous: communication is delayed, such as with e-mail and forums. The delays may be short (e.g. a daily e-mail) or longer (e.g. therapist's e-mail response every 3 days).
3. Random, periodic, or as required: either predetermined or in response to the user.

Guideline. The synchronicity of support and feedback are clearly reported within the program as well as the duration between program sessions, where relevant.

Facet 11: audience reach

This facet relates to the accessibility of an Internet intervention. Some online programs, particularly those with no professional or other (human) assistance, offer open access via the web or free and open-to-all online communication and thus have extremely broad reach (Christensen et al., 2004; Clarke et al., 2005; Farvolden, Denisoff, Selby, Bagby, & Rudy, 2005; Proudfoot et al., 2007) but potentially with limited treatment adherence. Others, such as those coupled with mandatory a priori clinical assessments or therapist assistance, have a more limited and narrow reach (Carlbring, Westling, Ljungstrand, Ekselius, & Andersson, 2001; Klein et al., 2006, 2010; Klein, Austin, et al., 2009; Klein, Mitchell, et al., 2009; Ström, Pettersson, & Andersson, 2000; Thorndike et al., 2008) but usually lead to greater adherence to treatment. A third type of intervention limits availability to users affiliated with a certain group or institution, such as military personnel, a certain clinic or hospital patients, or university students (Bergström et al., 2010; Hazzard, Celano, Collins, & Markov, 2002; Winzelberg et al., 2000).

Guideline. Details of the participant's mode of access to the intervention are clearly defined, as are the reasons for exclusion (if applicable). Additional information regarding other potential sources of support is provided in case participants drop out.

Facet 12: program evaluation

In considering guidelines related to efficacy, effectiveness, efficiency, and safety, those proposed for empirically supported psychological interventions (Chambless & Hollon, 1998; Chambless & Ollendick, 2001) and those established by the Society for Prevention Research (Flay et al., 2005) serve as a basic foundation. However, the processes of evaluation in the field of e-health are necessarily different and require their own research methodology.

While randomized controlled trials are prioritized in outcome research, other types of evaluation are also indicated in Internet intervention research. For example, formative evaluation is recommended to explore ways of meeting cultural, socioeconomic, and technological literary challenges of underserved groups (Ahern, 2007; Ahern, Kreslake, & Phalen, 2006) or those lacking the motivation or resources to access the Internet (Campbell-Grossman, Hudson, Keating-Lefler, & Heusinkvelt, 2009; Finfgeld-Connett & Madsen, 2008). Standardization of measures is desirable to aid comparisons across studies, and online tools should be validated against their paper-and-pencil or face-to-face counterparts (e.g. Carlbring, Brunt, et al., 2007; Herrero & Meneses, 2006; Lygidakis, Cambiaso, Cuozzo, & Bella, 2010; Thorndike et al., 2009, in press; Vallejo, Mañanes, Comeche, & Díaz, 2008). The use of online tests and questionnaires is feasible but should be cautiously handled in clinical-related assessments (Barak, 2010; Buchanan, 2003, 2007). In addition to symptom and/or behaviour change, users' functioning and quality of life can be measured as well as health service usage. Process measures, where applicable, such as usage, traffic, and utilization as well as dropout, are also important because they can shed light on delivery mechanisms, users' behaviour, differential attrition, and outcomes (Ahern et al., 2006; Christensen, Griffiths, & Farrer, 2009). Internet interventions are especially suited to monitoring effectiveness in clinical practice, such as assessing the client–therapist alliance, tracking processes of change, and assessing posttreatment and long-term functioning. Measures of user acceptance should go beyond the collection of satisfaction ratings from intervention "completers" to include acceptability surveys of nonusers and potential users, qualitative studies of how users interact with a system (Beattie, Shaw, Kaur, & Kessler, 2009), measures of

take-up rates, and reasons for disengagement. Feasibility and cost-effectiveness are yet other important factors, especially in relation to traditional interventions, and should be estimated or assessed (Abroms, Gill, Windsor, & Simon-Morton, 2009; Hedman et al., 2010; Klein et al., 2010; Schoenberg et al., 2008; Tate, Finkelstein, Khavjou, & Gustafson, 2009; Titov, Andrews, Johnston, Schwenke, & Choi, 2009; Warmerdam, Smit, van Straten, Riper, & Cuijpers, 2010). New approaches to data analysis (e.g. preference vs. randomized designs, statistical simulations, permutation analyses, tracking analyses) may be necessary in Internet intervention research as the field develops and evolves (Danaher & Seeley, 2009; National Cancer Institute & Robert Wood Johnson Foundation, 2001). Mixed-method research that utilizes qualitative methods to help understand the quantitative results are also sometimes necessary (Glasgow, 2009). Some Internet intervention research resembles the evaluation of "complex interventions" (Campbell et al., 2000). In these cases, recognition of additional complexities, such as participant preferences, selection biases, differential dropout rates between intervention and control groups, as well as the use of appropriate quantitative and qualitative approaches, is recommended.

Guidelines.

1. Efficacy: Guidelines here are similar to those in CONSORT-R for randomized controlled trials. Researchers define the size and characteristics of their sample on the basis of a power analysis (including the proportions of participants taking medication and changing their dosage during the trial), outline the method of group allocation conducted (including how it was concealed), define the comparison groups, cite the psychometric properties of the measures used, outline the data collection procedures and the schedule of measurements implemented (including long-term follow up), and describe the type of data analyses undertaken, including whether they are completer or intention-to-treat analyses. Importantly, they provide details of the sample attrition at each study time point and the methods of analysis employed to handle dropouts if

appropriate. Details of adherence to the intervention are also provided, including participants' reasons for nonadherence where relevant. Findings of the study and the conclusions drawn are reported.
2. Effectiveness: Information about the intervention's effectiveness in real-world conditions is reported, including the size and characteristics of the sample, the measures applied, and the time schedule over which the assessments were taken. Routine outcome measurement is reported as well as participants' adherence to the intervention. An outline is provided of the generalizability of the program's effects and user suitability characteristics.
3. Readiness for mass dissemination: Cost-effectiveness data are reported (as per the efficacy guidelines above), along with information about the capacity for the program to be to scaled up for widespread release, including inherent safety provisions.

Conclusion

The field of Internet interventions is growing. Evidence can be seen in the increasing penetration of such interventions into therapist training programs and into the roles of new behavioural and mental health professionals (such as low-intensity practitioners; Bennett-Levy et al., 2010), by the expanding number of intervention websites, and by the fast-growing number of people in need who seek and receive professional help online. Simultaneously, research in this area is increasing rapidly too. This growth can be facilitated by considering clear, broadly accepted, substantiated guidelines for the execution and reporting of scientific research, which will also promote efficient and improved communication among researchers in the field.

The guidelines were derived using an iterative model of discussion leading to consensus. It is important to note that any set of guidelines is not simply and automatically adopted by its relevant users unless there are broadly accepted regulations assigned to it. This means that the set of guidelines proposed here must be discussed by the professional community before acceptance and broad implementation can be expected. Consequent practical steps may include

adoption by relevant bodies and professional organizations as well as by journals and other publication outlets. Needless to say, governing committees and national agencies will need to be involved in actual implementation. This has been exemplified and stressed by developers of equivalent guidelines for Internet-based experimenting (Reips, 2002), Internet-based research (Spyridakis, Wei, Barrick, Uddihy, & Maust, 2005), and Internet-delivered testing (International Test Commission, 2006). With the information presented here, researchers have guidelines to follow when executing and reporting their research as well as an infrastructure for further discussion and development in the field of Internet intervention research.

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