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Current and Future Trends in Internet-Supported Mental Health Interventions

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Despite growing research in the past two decades involving Internet-supported or online mental health interventions, there has been only a few attempts to provide a synthesis of the research findings and future trends. The Internet has grown exponentially during this time, providing greater access to a wider population than ever before. Consequently, online mental health interventions have the potential to be cost-effective, convenient, and reach a more diverse population than traditional, face-to-face interventions. This paper reviews and summarizes the current research for online mental health interventions and discusses future trends. These interventions range from psychoeducational static webpages and complex, personalized, interactive cognitive-behavioral-based self-help programs, to videoconferencing, self-help support groups, blogging, and professional-led online therapy. Future trends in online interventions include the greater prevalence of online therapy and the use of video chat and videoconferencing technologies to enhance and extend the therapeutic relationship. The use of texting or short message service (SMS), mobile communications, smart phone applications, gaming, and virtual worlds extends the intervention paradigm into new environments not always previously considered as intervention opportunities. We find that there

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is strong evidence to support the effective use and future development of a variety of online mental health applications.

KEYWORDS *computer, cyberpsychology, e-therapy, Internet, online intervention*

INTRODUCTION

Nothing has made a greater impact in the way information is delivered to the average person in the past thirty years than the Internet. The Internet has transformed the way we research topics, explore new ideas, and communicate with one another. It has the potential to bring us closer together—not only to the people we know but also to our colleagues and others we have never met except online. See, for example, emerging social networking websites targeted to psychotherapists (e.g., *Therapy Networking*, at <http://marketing4therapists.ning.com>) and physicians (*Sermo*, at <http://sermo.com>). In addition, the Internet has done something no other technology before it has ever accomplished—providing access to free or low-cost psychotherapeutic interventions that simply were not possible thirty years ago (such as *MoodGYM*, at <http://moodgym.anu.edu.au>).

This article examines current Internet mental health interventions and discusses future trends for such interventions. Current web-based interventions include everything from static, information-providing websites, to complex, interactive cognitive-behavioral therapy (CBT) programs delivered online. Other interventions, such as online therapy, offer a convenient, low-cost and effective alternative to traditional face-to-face psychotherapy. Online mutual self-help support groups and blogs provide constant emotional social support and feedback. Other modalities and technologies are paving the way for the next generation to access online mental health interventions in ways not dreamed of today. All of these interventions are now building upon two decades' worth of research demonstrating their efficacy.

Online mental health interventions appear to hold great potential—they offer direct, convenient access to resources that a person might otherwise not have, especially because nearly two thirds of all people with diagnosable mental disorders do not seek treatment (Kessler et al., 1996; Regier et al., 1993). Internet-based (or Internet-supported) interventions provide the outreach dimension mental health services have always sought. Online interventions also offer individuals increased privacy and anonymity, and can offer a cost-effective method that more readily addresses persons living in isolated geographic areas, even reaching disenfranchised and minority populations (Changrani et al., 2008). And, by using the Internet as a communications modality, people feel less inhibited, which may encourage more personal, emotional expression and self-reflection (Suler, 2004).

Internet-based mental health interventions, however, are not meant exclusively as a replacement to face-to-face interventions. They can act both as a gateway to a person receiving in-person help, and to supplement such help. For the first time in history, online interventions offer an opportunity for human services to provide achievable population-wide prevention of mental disorders. Previous attempts at using the mass media, such as television or radio, have resulted in educating more people about mental health concerns but not directly helping them. As healthcare transforms itself from simply identifying and treating problems and conditions to recognizing the value of health management—that is, helping people become empowered, informed, and actively involved in their health throughout their entire life-span—online interventions may go beyond the traditional disease model and traditional patient/doctor interactions. Such interventions can help people self-identify potential concerns before they become life-altering, and offer them self-directed interventions that reduce the likelihood of the concern turning into a full-blown disorder.

Previous attempts in examining online mental health interventions have offered a broad picture of the emerging “telehealth” landscape (Jerome et al., 2000; Maheu, Whitten, & Allen, 2001) as well as an interesting literature review of a number of earlier Internet mental health interventions (Ybarra & Eaton, 2005). Bennet and Glasgow (2009), for instance, examined the efficiencies and drawbacks of using the Internet as a platform for delivering e-health tools to consumers. However, because the Internet and how people use it change so often, reviews of this topic area must be made and published regularly to keep up with the ever-changing landscape. The current review seeks to build and expand upon these prior works, looking not only what is known today based upon the literature, but offering grounded predictions for future mental health interventions online.

The current review is divided into two primary sections—current interventions and future trends. Under current interventions, five categories are identified. *Online Counseling and Psychotherapy* is defined as a mental health intervention between a patient (or a group of patients) and a therapist, using technology as the modality of communication (e.g., *Headworks* at <http://www.headworks.com/> or *LivePerson* at <http://counseling.liveperson.com>). These interventions include everything from e-mail exchanges, text chat room conversations, webcams (cameras that transmit video over the Internet), and voice-only exchanges (using a computer program like *Skype*). *Psychoeducational Websites* are largely static and informational in nature, with no direct, personal interaction with a therapist or interactive program that seeks to guide the individual on a specific course of treatment. Much like a book or encyclopedia can be helpful, but offer no personalized advice, psychoeducational websites help people learn about a particular mental health concern in general.

Interactive, Self-Guided interventions refers to a technology, most often a website, that offers an individual the opportunity to interact with a

structured, self-guided software program online that steps them through a program of self-help. These programs are usually drawn from the cognitive-behavioral literature and offer interactive exercises to the user. Although such self-guided interventions offer information and help educate a user about cognitive-behavioral theories, it is secondary to their ability to help a person through a structured set of modules of instruction and exercises. Such interventions may also use other technologies to enhance their effectiveness, such as through texting (short messaging service [SMS]) or smart phone applications.

Online Support Groups and Blogs are defined as peer-led and peer-focused interventions that may be interactive (support groups) or more static in nature (blogs), but that are focused on patients helping one another or expressing themselves in a largely unstructured manner that has little or no direct professional or psychological intervention. Blogging, which can be used for journaling, offers individuals a method of chronicling their thoughts and feelings online in a public or private manner. Comments to blog posts, however, offer a new and valuable feedback dimension not available in hand-written personal diaries of the past. Blogging can take many forms online, ranging from a full-fledged stand-alone blog to “micro-blogging” platforms (also known as “status updates”), such as those made available on *Facebook* or *Twitter*.

Last, *Other Types of Online Interventions* refers to interventions that do not fit into one of the above categories. This includes applications that run on smart phones, like the *iPhone* or *Android* devices, and tablets, like the *iPad*, and similar devices running mobile applications (called “apps”). It also includes far more complex interventions delivered through virtual worlds such as *Second Life*.

In the second section, future trends are discussed in three main categories. *Online Counseling and Psychotherapy* reviews the future of Internet-based, person-to-person psychotherapeutic interactions. *Interactive Self-guided Interventions* examines how these mostly web-based interventions can reach more people than individual, one-on-one counseling can. *Other Types of Online Interventions* include three subcategories. *Online Virtual Reality (VR) Therapy* covers important developments in VR technology and treatment. *Therapy through Gaming and Virtual Worlds* looks at how game mechanics and virtual worlds can help behavior change. Finally, *Mobile Internet and Texting (SMS)* examines how smart phones and ubiquitous text messaging can help with mental health issues.

As with any therapeutic intervention, online mental health interventions—whether mediated by a human or not—have their drawbacks as well. These limitations and concerns are discussed within each section below.

Accessibility of Internet-based interventions remains a concern, as up to one quarter of American households, for instance, do not have a single Internet user (National Telecommunications and Information Administration,

2010). Internet access appears to impact rural users more than urban users (National Telecommunications and Information Administration, 2010). In a survey of urban minority youth, for instance, 96% said they had access to the Internet either at home, school or at work (MEE Productions, 2010). In the same survey, 92% claimed ownership of a mobile phone used for texting, accessing the Internet, taking photos, and playing games (MEE Productions, 2010). Although this “digital divide” is decreasing (National Telecommunications and Information Administration, 2010), special attempts are taking place to enhance accessibility of online interventions (e.g., Christensen, 2010).

Reimbursement of Internet-based interventions continues to resemble a patchwork quilt in the United States (APA Practice Organization, 2011), but is less of an issue in some other countries. Although many of the interventions discussed here are available at no cost (such as psychoeducational websites, blogs, smart phone applications, and interactive, self-guided interventions), Internet-based psychotherapy and counseling, as well as virtual reality interventions, often command prices similar to in-person treatment. Only Medicare and 12 U.S. states require private insurance reimbursement for “telehealth services,” and reimbursement is often limited to only videoconferencing or webcam-based interventions (APA Practice Organization, 2011); Medicaid reimbursement is state-dependent as well (APA Practice Organization, 2011). In countries like the U.K., Australia, and The Netherlands, such Internet-based treatments are often available at no cost to the end-user (paid for by the government).

CURRENT TRENDS IN INTERNET MENTAL HEALTH INTERVENTIONS

Internet, or online, mental health interventions today take many forms, ranging from online therapy (also referred to as e-therapy) and interactive online psychoeducational programs, to self-help support groups and static, information-providing websites.

Strategies for self-care that have been successfully employed in the off-line world for decades have also been translated to the online world. Examples of these include self-help (or peer-led) support groups, bibliotherapy, and journaling. Research has demonstrated the positive, therapeutic effects of face-to-face support groups (Humphreys, 1997; Tanis, 2007), and there is evidence to suggest that these effects may be translated to online support groups as well (see, e.g., Meier, Lyons, Frydman, Forlenza, & Rimer, 2007).

Current Trends in Online Counseling and Psychotherapy

Internet psychotherapy (also referred to as online therapy or e-therapy) has been available for over 16 years (Goss & Anthony, 2009; Grohol, 2004,

2010a). It is available in many forms, ranging from back-and-forth secure e-mails between therapists and clients, to text chat-based, audio-only or webcam interactions where both therapist and client meet virtually online. Although the vast majority of online therapy is still conducted via e-mail today, new technologies such as front-facing smart phone cameras, *Skype* and other Internet-based video chat service may well change that.

Internet psychotherapy has gradually grown and expanded its focus, offering a distinct type of psychotherapy that addresses both serious mental disorders, and less serious issues in dealing with everyday life (Grohol, 2004). Online therapy is a therapeutic intervention that is administered individually or in groups by a trained mental health professional, and may occur via e-mail, chat, forums, and audio or video (e.g., webcam). A number of textbooks are available devoted to the practice and methods of online therapy (Anthony & Merz Nagel, 2010; Derrig-Palumbo & Zeine, 2005; Kraus, Stricker, & Speyer, 2010). Little research has been conducted on the demographics of those seeking online therapy. In one of the few studies available of 214 patients seeking online counseling, DuBois (2004) found that more women than men sought out online therapy; no differences in age or presenting problem was observed compared with a sample of 6,282 in-person counseling subjects.

Research consistently has demonstrated strong support for the value of online therapy in helping increase positive client outcomes (e.g., Robinson & Serfaty, 2008; Spek et al., 2008). A meta-analysis by Barak, Hen, Boniel-Nissim, and Shapira (2008) examined data from 92 Internet-delivered therapy studies, thus adding to our understanding of previous meta-analytic studies (Spek et al., 2007). Barak et al.'s meta-analysis examined only studies that implemented an actual psychological intervention, had prepost quantitative comparisons, at least one outcome measure, and had more than five participants. The researchers found a medium effect size (0.53) for online therapy, and found the effect to be long lasting.

Barak, Hen et al. (2008) also found no significant differences between the use of a human therapist or a web-based therapy intervention to deliver an online mental health intervention. The researchers also found that online individual therapy was more effective than online group therapy, and that interactive websites—those that require direct user participation—had a significantly greater effect size than those where the websites passively imparted static information to users. They also found evidence to suggest that chat and e-mail modalities have significantly higher effect sizes than forums and webcams. The researchers discovered no significant difference between providing face-to-face therapy compared to providing therapy online, suggesting that online therapy is just as effective as face-to-face provided psychotherapy.

Individual psychotherapy remains the most commonly practiced form of online therapy most often conducted via e-mail exchanges with the client (see recent surveys by Finn & Barak, 2010, and the International Society

for Mental Health Online, 2011). These e-mail exchanges are usually conducted in an encrypted and secure environment. Because such exchanges are *asynchronous* (meaning they do not have to occur at the same time, or *synchronously*), they are more convenient for clients and often cost less. However, e-mail and other online text-based exchanges lose nonverbal signals, thought to make up the majority of our communication with another person (Mehrabian, 1971). Existing therapeutic techniques and theories have been adopted for online use, including cognitive-behavioral and solution-focused therapies (e.g., Murphy, MacFadden, & Mitchell, 2008; Robinson & Serfaty, 2008; Spek et al., 2008).

Webcam and smart phone video, as well as text-based instant messaging, are also used therapeutically (International Society for Mental Health Online, 2011). These modalities are commonly conducted on a technology platform or website that takes care of the technical and security components of such interactions. Although these modalities allow for a more immediate and spontaneous interaction that may more closely resemble traditional psychotherapy sessions, their synchronous nature means similar scheduling needs and costs to in-person treatment. Research demonstrates that important process and client-counselor relationship variables are similar to equivalent face-to-face-therapy. These variables include items such as therapeutic alliance (King, Bambling, Reid, & Thomas, 2006; Leibert, Archer, Munson, & York, 2006) and session impact factors (Barak & Bloch, 2006; Reynolds, Stiles, & Grohol, 2006).

Online group therapy is not as commonplace as individual therapy and is typically conducted in a closed, private, group messaging environment led by a professional therapist (Bellafiore, Colon, & Rosenberg, 2003). Although many such groups are asynchronous, some professionals have also offered real-time group chats (e.g., Golkaramnay, Bauer, Haug, Wolf, & Kordy, 2007; Hopps, Pépin, & Boisvert, 2003). Barak, Hen et al. (2008) found that group interventions fared significantly worse off than individual therapy sessions delivered online (or even web-based psychoeducational interventions), perhaps due to the small number of studies included in the analysis (compared with individual online interventions).

Online therapy is marketed to consumers both by individual practitioners, as well as by commercial online therapy services (similar to an in-person group practice). Commercial services or “virtual clinics”—such as *LivePerson* (at <http://counseling.liveperson.com>), *Ask the Internet Therapist* (at <http://asktheinternettherapist.com>) or *Online Counseling* (at <http://etherapistonline.com>)—can provide the therapist with external verification of their credentials, as well as access to record keeping and technology platforms. These online clinics also usually better market the availability of mental health professionals through increased visibility in Internet search engines and other websites (Finn & Bruce, 2008). The same researchers, however, also reported some serious concerns with virtual clinics, including

liability questions regarding a client in crisis, child and elder abuse reporting requirements, and how credit card payments are properly handled.

There are a number of additional concerns with online therapy. In some modalities of online therapy, such as e-mail or chat, there are no nonverbal cues. Some clients and therapists might be uncomfortable with the lack of nonverbal cues because these are “important ingredients in the counseling process” (Rochlen, Zack, & Speyer, 2004, p. 272). Although safety and privacy concerns have also been raised about the online therapy process (Zack, 2010), in the United States such concerns have been somewhat mediated by the issuance of the Health Insurance Portability and Accountability Act of 1996 (HIPAA) Privacy and Security Rules, which regulate the privacy and security of technology used in all healthcare transactions. Zack (2008) outlines and summarizes many of the legal considerations in providing Internet psychotherapy in the United States.

Because of the growth and popularity of social media and social networking websites such as *Facebook* and *Twitter*, confidentiality and the privacy of patients interacting with a therapist online require special attention. Legitimately or not, many therapists look for online information about their clients (Clinton, Silverman, & Brendel, 2010; DiLillo & Gale, 2011), thus raising interesting professional, ethical, and legal questions. Therapists who are considering online therapy should be aware of the risks to the patient’s privacy and confidentiality and ensure they have a social media policy in place (see, for example, Kolmes, 2011). They should also contact their professional insurance carrier to determine whether online therapy will be covered by their policy. As with any new therapeutic technique or modality, professionals would likely benefit from engaging in formal training in online therapy before practicing it (Finn & Barak, 2010; Murphy et al., 2008).

Internet-based psychotherapy costs are similar to in-person costs when the intervention is offered through text-chat or webcams, ranging anywhere \$1.75 to \$4.99 per minute in the United States (Grohol, 2011). Internet-based psychotherapy costs are often lower when the intervention is asynchronous and conducted through e-mail, ranging anywhere from \$25 to \$125 per e-mail exchange with the therapist (Grohol, 2011). Government and private insurance may reimburse for the intervention if it is conducted by videoconferencing or webcam, but most online therapy is conducted under a fee-for-service model today (International Society for Mental Health Online, 2011).

Psychoeducational Websites

Not all mental health interventions online are done vis-à-vis a professional. Websites ranging from static, information-providing psychoeducational sites, to more interactive, cognitive-behavioral-based programs that deliver a complete tutorial online are also available. Ritterband et al. (2003) found that research on such web-based interventions generally showed positive

outcomes and therapeutic value. Meta-analyses and comprehensive reviews conducted in recent years, on a variety of mental health problem areas (Barak, Hen et al., 2008) as well as specific problems such as smoking cessation (Myung, McDonnell, Kazinets, Seo, & Moskowitz, 2009), anxiety (Reger & Gahm, 2009; Spek et al., 2007; van't Hof, Cuijpers, & Stein, 2009), depression (Spek et al., 2007, 2008) traumatic stress (Amstadter, Broman-Fulks, Zinzow, Ruggiero, & Cercone, 2009), alcohol consumption (Bewick et al., 2008), chronic pain (Macea, Gajos, Calil, & Fregni, 2010), pediatric health (Cushing & Steele, 2010), and eating disorders (Neve, Morgan, Jones, & Collins, 2010; Newton & Ciliska, 2006), provide well-substantiated evidence for the efficacy of such interventions.

Psychoeducational websites that provide general mental health information such as symptoms and treatment can best be viewed as a variation of bibliotherapy (Carlbring, Furmark, Steczkó, Ekselius, & Andersson, 2006) and are generally free to the user. Despite bibliotherapy's effectiveness in the treatment of not only mild concerns, but even serious emotional disorders (den Boer, Wiersma, & van den Bosch, 2004) it is often not formally prescribed by a primary care physician or mental health professional (e.g., with a prescription pad, like psychiatric medications; Naylor et al., 2010). Psychoeducational websites have not only made access to a form of bibliotherapy far more readily available to the general public, but they have also been shown to be effective in their own right (Freeman, Barker, & Pistrang, 2008; Griffiths & Christensen, 2007). Such books are also often available for downloading to popular smart phone devices and tablets.

Psychoeducational websites are primarily designed to impart information passively, through minimal interaction with the user. Examples of such primarily-static sites include government-run sites such as the *NIMH* (<http://www.nimh.nih.gov>), university-affiliated sites such as *BluePages* (<http://bluepages.anu.edu.au>), and nonprofit sites such as *Mental Health America* (<http://www.mentalhealthamerica.org>) to more commercial sites such as *Psych Central* (<http://psychcentral.com>). They can also include online self-help books, such as *Psychological Self-Help* (Tucker-Ladd, 2009) complete with illustrative examples and exercises. Sometimes such sites may feature their own app available for downloading to a smart phone or tablet, which makes their content easier to navigate.

The primary limitation of psychoeducational websites is that, by their very nature, they usually cannot provide personalized health information to the user. A second limitation is that the quality of psychoeducational websites varies widely. For example, Zermatten, Khazaal, Coquard, Chatton, and Bondolfi (2010), in a review of 45 websites on depression, found good quality depression content among their sample, based upon accountability, interactivity, aesthetics, readability, and content quality. Morel, Chatton, Cochand, Zullino, and Khazaal (2008) also found good quality content in 34 websites on bipolar disorder they reviewed. Morel and his colleagues determined a

“good quality” website via attributes such as readability, content quality, accountability, and interactivity of the website. Bremner et al. (2006), however, in a review of 72 websites on trauma and PTSD, found that 42% of the websites had inaccurate information and 82% did not provide a source for their information. The Health on the Net Foundation’s Code of Conduct (HONcode; 2011)—a website publisher’s declaration of adherence to a standardized set of publishing principles for health information—may help as a quality indicator for U.S. consumers. Zermattan et al. (2010) found that websites the displayed the HONcode label had significantly higher accountability and content quality. In addition to looking for HONcode label on a website, consumers can use online tools to help them determine whether the information presented is trustworthy and reliable. One such tool is DISCERN (<http://www.discern.org.uk>), a 16-question quiz designed to be used by consumers to help them determine the quality of a consumer health website.

Interactive, Self-Guided Interventions

Compared to psychoeducational websites—which tend to only present information in a noninteractive manner—online self-guided treatment interventions require significant user involvement in order to complete. Although their primary mode of teaching is similar to static, psychoeducational websites—imparting information through the teaching of didactic material—they are more dynamic and personalized to the user’s specific issues or condition. Unlike static websites, such interventions are usually informed by a specific psychological theory (most often CBT) and offer tailored responses and feedback (Barak, Proudfoot, & Klein, 2009). Tailored responses can range from simple mirroring based upon the user’s responses to offering full-fledged diagnostic and treatment recommendations. The most complex online interventions offer not only tailored responses, but also alter the entire manner in which the program is presented to the individual, skipping unneeded modules and providing information in a format most agreeable to the user (e.g., a teenager might enjoy more games or videos).

The most recent meta-analyses conducted on interactive, self-guided cognitive-behavioral psychotherapy interventions have mixed findings. For instance, Spek et al. (2007) examined online interventions for depression and anxiety and found support for such interventions for anxiety, but less so for depression. Health-related issues such as physical pain and headaches were found to be helped by online CBT, and the researchers reported impressive effect sizes (Cuijpers, van Straten, & Andersson, 2008). A third meta-analysis found that the use of electronic devices, including computers, in some cases matches the outcomes of face-to-face therapy in the treatment of anxiety disorders (Cuijpers et al., 2009). But each of these reviews noted that time spent with a therapist in person remained the greatest predictor of positive outcomes in the studies. In an effort to reproduce the benefits of time spent

with a therapist on a larger scale, some researchers have argued that we need to create “illusionary therapist-assisted systems”—computer systems that mimic the interaction between therapist and client (Helgadóttir et al., 2009, p. 251).

MoodGYM, developed by the Centre for Mental Health Research at the Australian National University (2011), is an example of an online self-paced, self-tailored treatment program for preventing and treating depression. Its interventions are based upon cognitive-behavioral and interpersonal therapy theories and are delivered through modules on its website. The program contains information, demonstrations, questionnaires, and skills exercises in areas such as problem solving, cognitive restructuring, assertiveness, and self-esteem training (O’Kearney, Kang, Christensen, & Griffiths, 2009). Research into *MoodGYM* has demonstrated its generally positive effects in helping reduce symptoms of anxiety and depression, in both adults and teens (Christensen, Griffiths, Korten, Brittliffe, & Groves, 2004; Griffiths & Christensen, 2007; Griffiths, Christensen, Jorm, Evans, & Groves, 2004; O’Kearney et al., 2009). Over 400,000 users have signed-up for the free *MoodGYM* program (Centre for Mental Health Research, 2011).

Beating the Blues is a UK-based program comprising eight 50-minute weekly sessions conducted on a stand-alone computer or online. This program is meant to be “prescribed” by the person’s general practitioner as a way of providing a more immediate intervention to those who seek help for depression from their physician. According to early data from the program, researchers saw a decreased of 50% in multiple outcome measures (Cavanagh, 2009). Additional UK-based online self-help interventions include, for instance, *Down Your Drink* (<http://www.downyourdrink.org.uk>) for problem drinking, and *Fear Fighter* (<http://fearfighter.com>), a site used to treat panic attacks and phobia using cognitive behavioral techniques (Cavanagh, 2010).

Some of these programs have passed enough rigorous testing to be approved for reimbursement by some governments, such as the U.K.’s National Health Service (see their website for more information, <http://www.nhs.uk>). For instance, *Beating the Blues* is free to over 70% of people who live in the UK. (availability is determined by whether the general practitioner’s practice has signed up for it or not).

Dozens of additional web-based intervention programs exist today, treating everything from eating disorders (e.g., Celio Doyle et al, 2008; Jones et al., 2008) and alcoholism (Riper et al., 2007), to smoking cessation (e.g., Etter, 2009), panic disorder (e.g., Ruwaard, Broeksteeg, Schrieken, Emmelkamp, & Lange, 2010) and PTSD (e.g., Klein et al., 2010). Research has also confirmed the effectiveness of web-based interventions for mental health disorders ranging from panic disorder, PTSD, depression, stress, insomnia, and eating disorders, among other concerns (Griffiths & Christensen, 2006).

Adherence and dropout are significant hurdles to virtually all web-based interactive treatment programs (Christensen, Griffiths, & Farrer, 2009). For

instance, only 37% of the people referred to the *Beating the Blues* program actually completed it (Cavanagh, 2009) and only 30% of participants completed three or more modules in at least one study of *MoodGYM* (O’Kearney et al., 2009). Wanner, Martin-Diener, Bauer, Braun-Fahrländer, and Martin (2010) demonstrated that even with the use of reminder e-mails, attrition rates were still significant and remain a hurdle to be overcome. Other online interventions have similar problems with high drop-out rates and poor adherence for completion. Failure to complete a targeted, web-based mental health intervention may reduce its effectiveness (O’Kearney, Gibson, Christensen, & Griffiths, 2006). Christensen et al. (2009) questioned whether dropout rates for online interventions were significantly different than dropout rates for other types of face-to-face treatments, such as psychotherapy or psychiatric medication appointments. In their systematic review of the randomized-controlled literature on Internet mental health interventions, they concluded that:

Treatment adherence [in the current review] was relatively high, at over 50%. These rates are relatively similar to those in randomized controlled trials of non-Internet-based interventions for generalized anxiety disorder (GAD) and depression, with a recent review suggesting attrition rates are about 15% on average for GAD, but the rate of dropout ranged from 0–50%. Our findings suggest that there is nothing particularly nonadherent about an Internet intervention per se when delivered in the context of a RCT.

Another limitation of web-based psychological interventions is the ability to detect and offer alternative treatment services to a person who may be in more immediate need of mental health treatment services or crisis (Barak, 2007). Because these programs are based primarily on the interaction between a patient and an interactive website, there often is not a professional overseeing the interaction or reviewing the patient’s data as they progress in the program.

Despite these limitations, web-based interventions offer an empirically-supported, cost-effective alternative to traditional in-person interventions. Furthermore, online interventions do not have to be complex and time-consuming to be effective. A simple online questionnaire paired with the ability to communicate anonymously with a clinical therapist has been demonstrated to significantly increase utilization rates by 300% in college students at risk for suicide (Haas et al., 2008). Unlike face-to-face interventions, the interventions described here also can reach across socioeconomic and geographic barriers, reaching populations that ordinarily might not seek treatment for a mental health concern (once research supports their use in different cultures). And these types of interventions have the potential to reduce overall healthcare consumption, while offering treatment outcomes that are similar to treatment as usual (de Graff et al., 2011).

Online Support Groups and Blogs

Not all mental health interventions online involve a professional or psychotherapeutic techniques. Self-help (or peer-led) support groups have existed online since the 1980s. Mutual self-help support groups rely on individuals to provide asynchronous general emotional and social support and information to one another, generally without a professional's intervention or guidance. An online support group may also take place in a chat room, with members who are logged in at the same time.

Online peer-led support groups, which are usually offered at no cost to end users, appear to be equally as effective as information providing websites to help people with psychological problems. For instance, in a study of 238 college students, Freeman et al. (2008) found that the two groups they studied—students who only viewed websites with information about student problems, and students who viewed such a website and also had access to an online mutual support group—improved in well-being and satisfaction with life. Online peer-led support groups generally foster a sense of well-being, control, self-confidence, and personal empowerment in many individuals who use them (Barak, Boniel-Nissim, & Suler, 2008). Patients who take part in an online support group generally feel more empowered, by becoming better informed about their condition and through the enhancement of their social well-being (van Uden-Kraan, Drossaert, Taal, Seydel, & van de Laar, 2009). However, a patient appears to benefit more from an online support group when they are engaged and actively involved in interacting with others (Barak, 2011; Barak, Boneh, & Dolev-Cohen, 2010). These studies showed a causal relationship between the degree of members' activity (posting new messages, replying to others, receiving replies from others) and personal outcomes.

Online peer-led support groups have potential drawbacks as well. Because they are peer-led, there may not be a common goal or progress made toward individual goals of improvement. Some online services, such as SparkPeople.com, seek to combine online support groups with specific goal-directed activities to help address this concern. Online support groups rely on other members to correct health or mental misinformation. Such misinformation has the potential to be damaging if not corrected (such as recommending a specific herbal treatment forgoing traditional psychiatric medications), or at least put into context (e.g., "check with your doctor before making any changes to your treatment"). However, in one content-analysis study of 1,112 messages exchanged in 10 different online cancer support groups, the researchers found little propagation of misinformation that wasn't also corrected by either another support group member or a moderator (Meier et al., 2007). Additionally, some groups have cropped up online that may reinforce or encourage distressing behavior (such as groups that help a person learn the best methods to commit suicide (Alao, Soderberg, Pohl, & Lolaalao, 2006; Biddle, Donovan, Hawton, Kapur & Gunnell, 2008)

or “pro-ana” groups (Brotsky & Giles, 2007; Day & Keys, 2008) to help a person become *more* anorexic.

A unique subtype of self-help groups is the computer-mediated support groups which include educational and group communication components, a closed membership and fixed duration, and include some form of professional or expert leader (Rains & Young, 2009). A successful example of a computer-mediated support group is the *Comprehensive Health Enhancement Support System (CHESS)*. CHESS participants receive didactic information about a specific health condition, support for decision making, skills training, and a closed discussion forum where they can receive support and share ideas with other group members. This program is effective in helping people cope with a wide range of health conditions, including asthma, smoking cessation, and breast cancer (Rains & Young, 2009).

Blogs offer another type of online mental health intervention similar to journaling. Although traditionally journaling has been encouraged and done in private to complement psychotherapy, blogging has taken many would-be private journals and turned them public. Feedback from others can help an individual learn to view feelings, thoughts, and situations in ways differently than they might otherwise. This continuous feedback loop provides another level of potentially therapeutic work outside of the therapy session (Grohol, 2010b; Merz Nagel & Anthony, 2009; Tan, 2008). Baker and Moore (2008) discovered that those *MySpace* users who blogged frequently increased their social integration and friendship satisfaction scores compared to those who did not blog. Ko and Kuo (2009) found that the more a blogger self-discloses on their blog, the more they alter their perception of their social integration and social capital, which in turn promotes their subjective well-being (e.g., happiness). Hoyt and Pasupathi (2008) found that blog writing for people after traumatic events could be therapeutically beneficial if tailored to their personal needs. In addition, they found that the number of readers' comments is associated with recovery, suggesting that social attention and support may also be important components of the change process. Blogs are usually free to users to start their own, read others', and to comment upon.

Additional hypothetical benefits of blogging for mental health would likely be similar to those detailed for writing in general (e.g., significant physical and mental health improvements, see Pennebaker, 1997). The reduction of an individual's inhibition online, called “disinhibition,” (Joinson, 2007; Suler, 2004) may also be therapeutically beneficial. For example, researchers suggest that blogging may provide an author with a platform on which to write where their writing is more honest and open than if writing to only oneself in a traditional paper journal (Possemato, Ouimette, & Geller, 2010). Self-directed writing—which is at the core of what authors of blogging do—has been shown also to have therapeutic benefits (Robinson & Serfaty, 2008).

Other Types of Online Interventions

Other technologies are also being used for mental health interventions, including virtual worlds such as *Second Life* and smart phone platforms being used to access the Internet. In a review of studies published to date that have used mobile phones to gather data or interact with clinicians, researchers found that mobile phones have a great deal of potential—largely untapped—as an adjunct to cognitive-behavioral therapy (Boschen & Casey, 2008). Some are beginning to tap the potential of mobile phones already—a set of cognitive-behavioral applications are already available for the *Apple's iPhone* and *iPad* called *eCBT Mood*, *eCBT Trauma* and *eCBT Calm* (Mindapps, 2011), allowing a person to interactively track and respond to negative irrational thoughts while on the go, anywhere in the world. Many of these types of innovative technologies and applications are offered for free, while others have marginal costs (less than \$5.00 typically).

FUTURE TRENDS IN INTERNET-SUPPORTED MENTAL HEALTH INTERVENTIONS

Over a decade ago, scholars in different areas of the mental health field projected the influence of the Internet on their respective disciplines in the future: Huang and Alessi (1996) in regard to psychiatry; Doyle, Ruskin, and Engel (1996) to medicine; Sampson, Kolodinsky, and Greeno (1997) to counseling; Wright (1996) to nursing; Grohol (1998) to psychotherapy; Giffords (1998) to social work; and Barak (1999) in regard to psychology in general. All scholars predicted that the Internet would have a significant impact on these various disciplines, from the distribution and efficient dispensing of professional information and the provision of assessments and interventions to conducting research and the offering of professional training and education. Indeed, not only have their projections been proven valid, but it seems that the applications and capabilities of computers and the Internet have prevailed in the mental health field, actually exceeding those predictions. The appearance of what is presently considered obvious, everyday applications—such as *Google*, *YouTube*, *Skype*, *Facebook*, *Twitter* and mobile devices—enabled social and professional developments through cyberspace that have significantly elevated the capability of online human services. It would not be an exaggeration to conclude that health- and mental health-related disciplines have gone through dramatic changes in exploiting the Internet, changes that are extensively reflected in many of their operations and activities.

What scholars of the past decade did not foresee were the substantial and rapid technological developments in the area, some of which may be said to be even beyond rational prediction. For example, the operation of broadband and high-speed Internet communication on a regular basis, not

only in workplaces, but also in many homes and schools (Horrigan, 2009), was almost impossible to expect, as most online communication at the onset of public Internet employed 14.4K to 56K bps modems. Moreover, technologies we take for granted today, such as wireless Internet communication, did not exist at all. In relation to hardware, processing power, memory, storage, screen resolution, and color differentiation capabilities were quite limited compared to their present level of operation. Moreover, computer operating systems were relatively primitive in terms of the management capability of a computer. If we add to these embryonic technological devices the very limited application software that then existed, past professional achievements look much appreciated from the current point of view. We should also bear in mind that technology per se is socially meaningless; it becomes meaningful when it serves a significant cause. Therefore, the technological revolution we have experienced would not have been successful without actual professional and/or popular adaptation that caused actual personal and social changes. The current massive use and influence of Web 2.0 or social media tools—such as wikis, blogs, and social networks—make the mere technological developments valuable. No one, however, could forecast the prevalence of social media just a few years ago; all the more their impact on mental health services.

By deduction, our ability to forecast future trends in health and mental health Internet interventions is obviously doubtful. Thus, we will review here several of the foreseeable developments, based on current knowledge and technologies and being fully aware of the fact that although the “future is present” (Barak, 2005), it probably holds many unpredictable surprises. Nevertheless, as Holmes and Ainsworth (2004) indicated in their attempt to predict the future of online counseling, current therapeutic and technological trends may point to possible future developments. That is, state of the art technologies and applications may be used as a basis for our forecasts, though this depends on social acceptance. Past research examining emerging developments in mental health services (e.g., Kazdin & Stacey, 2011) suggests that trends often grow organically, and, in time, overwhelm more traditional approaches.

Our projections are divided into several categories, each determined by technological procedures and applications to different therapeutic approaches and problem areas and reflecting different communication modalities. In each category, several practical applications and research findings examples are provided to clarify state of the art implementations and future trends.

Online Counseling and Psychotherapy

Counseling and therapy conducted through the Internet constitute an evolving field of practice with growing popularity and are the subjects of

continuous empirical research (Abbott, Klein, & Ciechomski, 2008; Barak et al., 2009; Chester & Glass, 2006; Finn & Barak, 2010). It seems that with strict, institutionalized training (Cárdenas, Serrano, Flores, & Rosa, 2008; Gehl, Anthony, & Nagel, 2010; Haberstroh, Parr, Bradley, Morgan-Fleming, & Gee, 2008; Murphy et al., 2008), enhanced ethical codes (Eccles, 2010; Graff & Hecker, 2010; Kraus, 2010b; Midkiff & Wyatt, 2008; Rummell & Joyce, 2010), and vetted therapists' online directories (Finn & Bruce, 2008), this mode of providing mental health services will flourish both in private practice and in workplaces and schools. Members of the International Society for Mental Health Online (ISMHO, at <http://www.ismho.org>) promote the practice of online counseling and therapy.

Although text-based therapy continues to be dominant in allowing therapist-client communication (Suler, 2008, 2010), upgraded technologies (e.g., webcam, audio chat, smart phones) and advanced social acceptance and training make online audio and video more popular for therapeutic purposes. Albeit using audio and video technologies might be seen as desirable, in better exploiting computer and network ever-improving technology, some doubts might be raised in regard to their therapeutic advantages as anonymity and unidentifiability seem to be part of the critical foundations of online provision of mental health (Suler, 2010). Perhaps in exploiting the power of reading and writing for people who seek mental help, text-based therapeutic communication might prevail in terms of personal change. A study by Kessler et al. (2009), for example, found effective outcomes for text-only chat intervention in treating depressive patients, using a CBT approach, without having any other contact with these patients. However, more advanced technologies and richer and well-integrated online media might provide therapeutic channels that fit ever-changing behavioral norms, popular Internet applications (e.g., *Facebook*), and expectations of many, thus paving ways to expanding use of such applications. Kraus (2010a) projected that, in applying online counseling techniques, videoconferencing technologies would prevail as it most closely emulates face-to-face therapist-patient contacts. On the other hand, there are reasons to believe that anonymity, including visual anonymity (enabled by invisibility and the lack of eye-contact), continues to be of a major factor in providing online therapy in terms of users' preference (Suler, 2010). Thus, textual therapeutic applications—either through synchronous (chat or IM) or asynchronous (e-mail) communication modes—appears to still be preferred by patients seeking online therapy. In this regard, it seems that one of the key elements in evolving online counseling has to do with providing prospective clients the flexibility of choice, that is, alternative modes of communication, so they can fit their personal favorites and needs to various modalities for optimizing comfortable and effective counseling process. With such personal suitability, clients and counselors can develop better therapeutic alliance than in enforced conditions, even stronger than through face-to-face sessions

(Hanley & Reynolds, 2009). In summary, theory and research to date insinuate that old online communication technologies would prevail, perhaps with upgraded technological advances.

Despite the advantages of textual communication, it seems that users' preferences are moving toward a richer media: voice and vision through videoconferencing by way of using computerized audio and webcams. These advanced communication channels do not necessarily improve therapeutic rapport or the delivery of therapy but are increasingly being popular due to the expansion of upgraded technologies such as Next Generation Networking (NGN). Although mental health professionals tend to underestimate and even devalue the therapeutic alliance created via videoconferencing (Rees & Stone, 2005), accumulating evidence shows that such interventions are feasible and apparently as effective with many patients as face-to-face interventions are in a variety of distress areas (Simpson, 2009; Simpson & Morrow, 2010) and show similar level of therapeutic alliance to face-to-face intervention (Germain, Marchand, Bouchard, Guay, & Drouin, 2010). Focusing on psychiatric interventions, Antonacci, Bloch, Saeed, Yildirim, & Talley (2008), for example, advocated the use of videoconferencing (named telepsychiatry) in diagnostics and treatment and provided numerous case examples and research reports to support this application. Various recent developments have supported the applicability and feasibility of these technologically advanced implementations, including treating female survivors of childhood cancer (Cantrell & Conte, 2008), patients with OCD (Himle et al., 2006), PTSD (Frueh et al., 2007; Germain, Marchand, Bouchard, Drouin, & Guay, 2009), substance abuse (King et al., 2009), problem gambling (Oakes, Battersby, Pols, & Cromarty, 2008), traumatic stress (Todder, Matar, & Kaplan, 2007), family therapy (Dausch, Miklowitz, Nagamoto, Adler, & Shore, 2009), frail elderly people and their carers (Savolainen, Hanson, Magnusson, & Gustavsson, 2008), children with autism (Gibson, Pennington, Stenhoff, & Hopper, 2010), and adults caring for a family member with a chronic disease and obese adolescents (Marziali & Cohene, 2007).

It seems safe to predict that the use of audio- and video-based therapeutic applications will expand in the future as they fit what has become to be people's normative use of online communication through popular video chat software (e.g., *Skype*, *Google Video*). Moreover, as a growing number of companies develop such applications and invest in their marketing, increasing number of professionals will adopt them as a standard therapeutic tool. For instance, *ooVoo* software (<http://www.oovoo.com>) for video chat and videoconferencing make remote face-to-face individual and group therapy not only possible but easy to execute and maintain. This trend, operating side by side with more traditional online interventions, could meet a larger demand and expectations of clientele that avoids text-based interventions. It is also important to note that videoconferencing can (and apparently will)

be used for efficient training and supervision of therapists as it enables enriched practical modeling, live observation, and immediate feedback (Coursol, Lewis, & Seymour, 2010).

Interactive, Self-Guided Interventions

Many people refrain from therapy because of shame and personal exposure. Others have difficulties in scheduling therapeutic sessions with therapists or live in remote places. Still others tend to be individualistic and prefer independent ways of coping with problems. These people may prefer professionally-based online self-help over work vis-à-vis a clinician. Based on extensive past success in terms of efficacy and expansive use, it seems that interactive, self-guided interventions will have the opportunity to thrive. Extensive research that has been conducted on web-based, interactive self-help interventions unequivocally shows great support for this mode of mental health delivery, especially for CBT interventions (e.g., Barak, Hen et al., 2008; Cuijpers, Donker, van Straten, Li, & Andersson, 2010; Cuijpers et al., 2008). Newer web designs that seamlessly integrate interactive capabilities of online audio, video, quizzes, and simulations have the potential to make such interventions even more popular and effective. Given the generally unsupervised nature of this type of intervention, issues related to treatment credibility, therapist's credentials, and patients' suitability remain critical concerns (Andersson, 2009; Andersson, Carlbring, Berger, Almlöv, & Cuijpers, 2009).

Bennett and Glasgow (2009) suggested that:

The future of Internet interventions lies in their dissemination potential. It may be necessary to take steps to align research sites better with the types of programs that are rapidly evolving in the marketplace. This action will require greater attention to closing several design gaps and more broadly integrating Web 2.0 functionality into research Web sites (p. 285).

In regard to dissemination, it is likely that use and reuse of online self-help interventions are advanced in well-planned promotional procedures, including tailored professional communications and smart use of word-of-mouth, as well as the use of reminders and incentives (Crutzen et al., 2009, 2011). Given the current acceleration of web-based interventions in treating numerous mental health problems (Barak, Hen et al., 2009), however, it seems to be safe to forecast that such applications will flourish.

Despite the obstacles and challenges mentioned above, it seems that web-based interventions will encompass much of the delivery of mental health services. Moreover, web-based interventions could be well-integrated with advanced innovations such as ubiquitous and roaming computing, on the one hand, and cloud computing, on the other. These technological

developments allow greater flexible, adaptive, and tailored psychological implementations that may easily be referred to by referral websites (e.g., Beacon; Christensen, H., Murray et al., 2010). These advanced characteristics will apparently attract growing number of users to exploit web-based interventions—including those who consistently avoided them before—to allow greater outreach and promoted prevention and treatment efforts. Members of the International Society for Research on Internet Interventions (ISRII, at <http://www.isrii.org>) promote the use and research of self-help, Internet-based applications in a variety of problem areas.

One of the important issues that still deserve a deeper examination has to do with the necessity and importance of professional patients' guidance in using web-based self-help (van't Hof, et al., 2009). This issue has essential theoretical, ethical, legal, and practical implications on providing such interventions, all of which have been discussed but without a professional consensus being yet reached. Additional research is still needed in this area, apparently in examining the very necessity, type, and intensity of user guiding to accompany self-help interventions. In focusing on intervention outcomes, Berger et al. (2011), for example, found that the provision of patients' guidance accompanying self-help web-based interventions in the treatment of social phobia did not make a difference in terms of intervention outcomes. On the other hand, in discussing other important aspects, Marks and Cavanagh (2009) proposed that personal guidance, support, and monitoring are essential. Extensive reviews in computer-assisted self-help intervention of anxiety and depression (Newman, Szkodny, Llera, & Przeworski, 2011a) and in the area of drug and alcohol abuse and smoking cessation (Newman, Szkodny, Llera, & Przeworski, 2011b) suggested that the problem area might be an important moderating factor in considering the provision of personal guidance to consumers on top of self-help. The issue still warrants close examination under quite a few conditions; it seems safe to conclude, however, that web-based interventions can predominantly be based on self-help but optional professional user support might be inevitable.

Other Types of Online Interventions

ONLINE VIRTUAL REALITY THERAPY

Virtual Reality (VR) has been used successfully through standalone computers for some time (Glantz, Rizzo, & Graap, 2003; Gregg & Tarrier, 2007) and has been expanding continuously into a growing number of areas of treatment. VR has been offered online only in recent years (Riva et al., 2007), to the convenience of therapists and patients, to be used as a clinical component in face-to-face therapy. Following this development, numerous case treatment examples were presented (Riva et al., 2009), and included

assessment and treatment of obesity, alcohol abuse, anxiety disorders, GAD, and cognitive rehabilitation. Furthermore, in a highly challenging project, Carelli et al. (2009) developed and tested a NeuroVR-based tool aimed at the rehabilitation of stroke patients in shifting their attention and developing action planning functions using tasks reminiscent of daily life tasks. The significant advancement of computer software and hardware, including enhanced graphic capabilities, interactivity, and avatar personifications and anthropomorphisms, contribute to advancing the presence and the flow experiences that are critical to the attractiveness and effectiveness of online VR therapy. Quite a few VR applications are under development, focusing on various distress areas and aimed at various target populations. Botella, Quero et al. (2008), for example, recently developed and studied a VR system used to treat different types of animal phobias (spiders, snakes, etc.), and for public speaking (Botella, Guillen et al., 2008; Botella, Alcañiz et al., 2009), implemented online. This further step enables VR therapy from a distance and other advantages of clinical work online. Similarly, Rothbaum, Malcoun, Rizzo, and Josman (2010) reviewed several effective VR exposure therapy programs, including *Virtual Iraq* for the treatment of soldiers and veterans suffering PTSD following this war, and *BusWorld* intended to treat PTSD and other symptoms related to suicide bombs exploded in buses in Israel. The authors discussed future development of VR therapy in applying this approach over the Internet and pointed out the special advantages of such a move, especially in disseminating interventions to a broader population in need.

It seems that studying and developing the combination of technology (VR capabilities) and psychology (presence and flow) in this area could bring about significant changes in treating patients in numerous areas of distress. Members of the International Association of CyberPsychology, Training, and Rehabilitation (iACToR, at <http://iactor.ning.com>) promote the use of VR as an adjunct to traditional approaches in training, clinical work, rehabilitation, and education.

Applying VR software through online communication—enabled only with state of the art technologies—opens the door for professionals to adopt sophisticated therapeutic applications in a way that is both appealing to many potential patients and is feasible and efficacious. Also, clinical use of online VR exemplifies the possibility of a hybrid approach by combining in-clinic, in-person traditional therapy with targeted online components. Such integration of therapeutic approaches could meet expectations and preferences of many clinicians and patients. In addition, Internet-driven VR applications can efficiently be used to improve clinical training. This was exemplified by Yellowlees and his colleagues (Yellowlees & Cook, 2006; Yellowlees, Cook, Marks, Wolfe, & Mangin, 2008) who used Internet-based VR environment to educate about hallucinations. In using a similar approach, Reis, Freire, and Monguet (2010) developed a multimedia-rich site (*eSchi*) to

teach and train professionals on schizophrenia. As distance, Internet-based education flourishes, it seems that evolving VR clinical environments—including actual simulations, live interactive communication, live feedback, and video modeling—will be an integral part of counseling and psychotherapy training procedures.

THERAPY THROUGH GAMING AND VIRTUAL WORLDS

Taking part in computer games could prove therapeutic. For instance, Haier, Karama, Leyba, and Jung (2009) found that playing the highly popular Tetris computer game for three months improved brain and cognitive functioning in adolescent girls. In a more therapy-relevant research, a study by Holmes, James, Coode-Bate, and Deeprose (2009) found that playing Tetris could be beneficial in treating PTSD. Indeed, extensive literature reviews show that playing certain computer games (apart of their possible drawbacks)—online and offline alike—have a substantial impact on various health and mental health concerns (Freddolino & Blaschke, 2008; Gamberini, Barresi, Majer, & Scarpetta, 2008; Wilkinson, Ang, & Goh, 2008). Online games were shown to improve extreme pathologies such as schizophrenia too; Han, Kim, Lee, Min, and Renshaw (2008) and Han et al. (2010) found some positive effects on symptoms associated with schizophrenia in patients using online video games over 8 weeks and speculated these changes resulted by increased release of dopamine in frontal cortex. Hobbs and Yan (2008) showed significant cognitive and behavioral effects in reducing violence of highly violent children after using a web-based educational game for six weeks. Obviously, just using a computer game for alleged psychotherapeutic purposes may not be enough, as specific games should be designed in a purposeful way to achieve these ends and include clear guidelines and application strategies (Goh, Ang, & Chern Tan, 2008). Keeping this obvious directive in mind, it seems that various existing online games, as well as new ones, can be successfully used in integration with more traditional treatment of numerous problems.

Such playful therapeutic interventions can take place in *Second Life* and other virtual gaming worlds, as well as in Massively Multiplayer Online Role-Playing Games (MMORPG), like *World of Warcraft*, that provide space for simulations, behavior rehearsals, role-playing, and interpersonal exercising (Gaggioli & Riva, 2007). Gorini, Fasano et al. and Gorini, Gaggioli et al. (2008) proposed—and exemplified with an interesting case study—exploiting *Second Life* environment for virtual clinical sessions with patients in addition to periodic in-person meetings. Moreover, these authors argued that unique characteristics and capacities of virtual worlds—including psychological features in avatar-based interactions, VR exposure interventions, and patients' virtual communities—can significantly enhance face-to-face therapy as support tools. Imholz (2008) suggested using *Second Life*

particularly for role-playing and psychodrama, as the virtual environment may be considered ideal for performing these approaches under conditions where participants are not actually visible to one another. Another idea, recently voiced by several scholars (e.g., Terry, 2009), refers to the exploitation of virtual worlds for the treatment of autism (especially milder forms of autism, such as Asperger's Syndrome), as the virtual environment is perceived less threatening and more supportive for these patients. A technological and psychological breakthrough could be exemplified by Lisetti et al. (2009) who used biosensors with patients' avatars in applying exposure therapy in the treatment of anxiety disorders. Recently, Matthews and Coyle (2010) provided an interesting example how *Personal Investigator* (PI)—an advanced 3D computer game—may be used in clinical work. By adopting a highly engaging detective environment, PI encourages patients (usually adolescents) to understand problems, look for clues in solving them, search for ways of coping and solutions, and so on. Thus, by using a well-known and accepted computer environment, and through indirect and intriguing activities, therapists are able to approach and connect to young patients and promote their personal awareness and cognitive processing related to their distressful situations. Actually, virtual worlds and online gaming can be used and implemented in a variety of health and mental-health problems (Frenkel, 2009) in providing patients, especially children and teens, therapeutic environments and means of communication and relations they feel comfortable with. The industry of these innovative interventions is vastly developing in creatively coping with evolving technical challenges and accumulative scientific knowledge on professional interventions and patients' behavior in cyberspace (Ruppert, 2011).

Using online games and virtual social environments for therapeutic purposes has the advantages of both applying attractive and engaging activities for patients as well as creating conditions and situations relevant to distress being treated (Kato, 2010). The playful nature of gaming, that seems to meet basic human needs and typical activities, adds a special dimension to such applications thus could improve therapeutic outreach and practical accomplishments. No doubt, however, that some hurdles—such as unfamiliarity by clinicians of therapeutic video games, fear of their potential negative influences, and lack of research—inhibit this trend (Ceranoglu, 2010). Accumulating empirical success, on top of the advantages mentioned, may project to dramatic increase of computerized therapeutic-related games development and adoption by professionals.

MOBILE INTERNET AND TEXTING (SMS)

The emergence of mobile Internet, used through mobile devices such as mobile phones, has expanded therapeutic activities, as patients may receive web-based therapy and other advanced online interventions while roaming.

Moreover, e-mailing and texting by using short message service (SMS) could complement both face-to-face and classic Internet-supported therapy, especially in the context of behavioral and cognitive-behavioral approaches, by providing an efficient vehicle for reminders, feedback, reinforcement, and so on (Siau & Shen, 2006). A literature review conducted by Fjeldsoe, Marshall, and Miller (2009) clearly showed that SMS-delivered interventions have positive results at least on short-term behavioral outcomes. In addition, Krishna, Austin Boren, and Balas (2009) reviewed 25 empirical studies that investigated clinical use of SMSs and other applications through cellular phones in the context of health interventions and reported significant patients' improvement in the majority of the studies. Likewise, recent studies showed the effectiveness of "roaming therapy" in the areas of obesity (Kim & Kim, 2008), weight loss (Patrick et al., 2009), bulimia nervosa (Shapiro et al., 2010), family therapy (Bigelow, Carta, & Burke Lefever, 2008), schizophrenia (Pijnenborg et al., 2010, Pijnenborg, Withaar, Evans, van den Bosch, & Brouwer, 2007), smoking cessation (Brendryen, Drozd, & Kraft, 2008; Riley, Obermayer, & Jean-Mary, 2008; Whittaker et al., 2008, 2011), self-awareness (Morris et al., 2010), chronic pain (Kristjánsdóttir et al., 2011), and drinking (Campbell & Kelley, 2008).

Mobile devices, especially smart phones, have become very popular as means of communication. Technological advances make their use efficient, relatively simple, media rich, and inexpensive. In addition, using cellular as well as Wi-Fi communication technologies is considered durable and dependable even in extreme catastrophic situations (Barak, 2010), as recently evidenced in northern Japan's disaster (Tamura & Fukuda, 2011). Therapeutic applications ("apps") through *iPhone*, for instance, could prove very useful in outreaching clients with specific and even rare problems. The great advantage of being able to receive therapeutic-related messages and synchronously report to or chat with a therapist using text messages or pictorial evidence, in addition to the telephone-based audio features, introduce a significant change in therapeutic possibilities. It seems that this channel of communication in the context of health and mental-health will grow dramatically in the near future, independently as well as in an integrated way with more traditional interventions.

It should be cautioned, however—due to convenient commercialization and challenging regulatory procedures related to therapeutic applications delivered through mobile devices—that such apps might lead to pervasive unprofessional exploitation by technology developers (e.g., Abroms, Padmanabhan, Thaweethai, & Phillips, 2011). Also, public attitudes seem to be in favor of using therapeutic mobile applications for monitoring and management of depression, anxiety, and stress, as long as privacy and security are assured (Proudfoot et al., 2010), but leaks in this regard are still possible. In addition, social divide and accessibility issues should not be disregarded; in the context of using mobile phones for social and emotional support, for

example, Ben-Harush (2010) found that disadvantaged women refrained from using short conversations and SMS through cell phones despite their recognition of and need for emotional support mainly due to cost, in addition to reasons related to inconvenience, connectivity, and possible radiation. However, as mobile devices and their use gradually become less expensive, it can be assumed that exploitation of cell phones for the purpose of therapy as well as for professional or social support will significantly increase.

CONCLUSION

Several years ago, Casper and Berger (2005) noted that although the future of Internet-supported psychotherapy seemed to be bright, there was an indispensable need for additional research to examine whether goals were being met and that interventions were optimized for online use. It seems that Internet-based mental health applications have gained much supporting research (Barak, Hen et al., 2008), and research in this area is flourishing (Andersson, Ljótsson, & Weise, 2011; Glasgow, 2007; Proudfoot et al., 2011). Moreover, future directions highlighted by Ritterband et al. (2003)—including the need for research, practice procedures, ethical guidelines, expansion to additional technologies, and financial models—are also being addressed to a large degree (Barak et al., 2009; Ritterband & Tate, 2009). However, whereas the practice of Internet-supported health and mental health interventions is growing rapidly, the science of this field still leaves something to be desired (Ritterband & Tate, 2009).

It seems that the more basic concepts and ideas behind online clinical work receive insufficient attention as basic theoretical principles and a broad conceptualization is still missing. For example, little attention has been given and little research efforts have been made to investigate the effects of Internet-supported health and mental health interventions have on patient/therapist relationships (Yellowlees & Nafiz, 2010).

Suler (2002) suggested the intersection of advanced specialization, interdisciplinary professional engagement, online mental health networking, increased trends toward client empowerment, a developing theory of cybertherapy, and heightened automation. Internet-supported clinical work is gradually moving in this direction (Ritterband & Tate, 2009; Suler, 2008), in parallel to its growing social acceptance. Merging new social media technologies with patients' needs and advanced psychotherapeutic interventions seem to be the way of the future, especially through integrating various online applications and approaching potential patients in a comprehensive way.

For instance, Graffeo and La Barbera (2009) presented the possibility of the integrated use of *Second Life*, online television, *Blogger*, forums, and *Facebook* in outreaching and offering treatment. Another emerging path of professional interventions refers to growing personalization of clinical

procedures and programs. That is, by having useful alternative therapeutic Internet-assisted interventions, therapists could aim at a fit between online therapeutic procedure—through virtual gaming, online chat, videoconferencing, or an appropriate interactive self-help intervention, for example—to best suit consumers' needs, preferences, and personal characteristics. Indeed, empirical evidence suggests (e.g., Blankers, Koeter, & Schippers, 2011) that therapeutic goals could be reached by different Internet-assisted clinical options, in strengthening the trend toward personalization of therapy.

The question of cost-benefit aspects of computerized, online applications is intriguing. As mentioned earlier, in one-to-one Internet counseling and therapy fees are similar to those of in-person sessions, although office and transportation expenses are saved. However, in more automated systems—from using e-mail templates to providing CBT via web-based, interactive self-help therapy—development and maintenance costs are limited and covered after the first few hundreds of users. Several studies provided empirical evidence on cost-benefit issues: Abrams, Gill, Windsor, and Simon-Morton (2009) reported of a successful smoking cessation intervention using e-mail that significantly reduced traditional intervention costs. Olmstead, Ostrow, and Carroll (2010), in using a CBT-based computerized system as an adjunct to regular care in treating substance dependence, found that it meaningfully reduced costs of intervention. Schoenberg and his group (2008) showed that computerized rehabilitation with head injury patients revealed similar outcomes and had similar costs to traditional care. Titov, Andrews, Johnston, Schwencke, and Choi (2009) reported of a social phobia treatment program, that incorporated web applications and e-mails, that was found to be highly effective as well as highly cost-benefit in comparison to traditional intervention procedures. Warmerdam, Smit, van Straten, Riper, and Cuijpers (2010) reported of a study where both cost-utility and cost-effectiveness were investigated in web-based intervention for depression and for promoting decision-making. Both programs were found highly beneficial in cost and effectiveness terms. Smit and his associates (2011) showed how various eHealth applications in treating alcohol-related disorders significantly improved the cost-benefit of the care system. However, the question of cost-benefit of advanced technologies in clinical care still needs much research, especially as it seems that more successful programs usually need more therapist hours (Palmqvist, Carlbring, & Andersson, 2007), and that rigorous analyses of costs are still to be conducted (Tate, Finkelstein, Khavjou, & Gustafson, 2009).

According to the futuristic view of Alcañiz, Botella, Baños, Zaragoza, and Guixeres (2009), an “intelligent” e-therapy system should be based on four foundations: (a) ambient intelligence, for sensing (and consequently matching) physiological, psychological, and contextual information of the patient; (b) persuasive and effective computing for modifying behaviors; (c) ubiquitous computing for using the system from any location and at

any time; and (d) multiple technological platforms support. Such a comprehensive platform is still to be developed, but trials have been made exploiting such ideas (Botella, Gallego, et al., 2009). Obviously, legal, ethical and practical hazards and problems face innovative applications (Botella, Garcia-Palacios, Baños, & Quero, 2009), especially as many Internet users and societies may not be adequately prepared and educated for the ongoing sociotechnological revolution. However, recent attempts in developing evaluation criteria for online practice (Christensen, 2010) and for research on Internet interventions (Proudfoot et al., 2011) promise continuing improvements in this emerging field. In terms of health and mental health promotion, however, it seems that the future is very promising.

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