Chapter 1
The Evolution of Internet Addiction Disorder

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Abstract This chapter presents the history and evolution of Internet addiction and describes the risk factors identified. As the problem has become more widespread, new studies examine the neuroscientific causes of Internet addiction and ways that the disorder may be treated primarily using behavior therapy, cognitive-behavioral techniques, and residential care. The chapter also provides the theoretical frameworks to understand the etiologic models or causal factors associated with the development of Internet addiction including a brief overview of the neuroscientific studies recently done. Finally, this chapter reviews the current treatment models used in Internet addiction recovery. As an introduction to this book, it is hoped this chapter gives a historical context of the disorder and promotes future areas of research as new studies in the field continue to emerge.

1.1 Introduction

Internet addiction was first researched in 1996 and findings were presented at the American Psychological Association. The study reviewed over 600 cases of heavy Internet users who exhibited clinical signs of addiction measured through an adapted version of the DSM-IV criteria for Pathological Gambling (Young 1998). Since then, subsequent studies over the past decade have examined various aspects of the disorder. Early studies attempted to define Internet addiction and examined behavior patterns that differentiated compulsive from normal Internet usage. More recent studies investigated the etiologic factors or causes associated with the disorder. Much of this examined the impact of computer-mediated communication on the way people will adapt to interactive features of the Internet and initial studies from the United States spread into countries such as Taiwan, Russia, China, and the United Kingdom.

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As the problem has become more widespread, new studies examine the neurological causes of Internet addiction and ways that the disorder may be treated primarily using behavior therapy, cognitive-behavioral techniques, and residential care. This chapter presents the history and evolution of Internet addiction and describes the risk factors identified. The chapter also provides the theoretical frameworks to understand the etiologic models or causal factors associated with the development of Internet addiction including a brief overview of the neurological studies recently done. Finally, this chapter reviews the current treatment models used in Internet addiction recovery. As an introduction to this book, it is hoped this chapter gives a historical context of the disorder and promotes future areas of research as new studies in the field continue to emerge.

1.1.1 Diagnosis of Internet Addiction

Diagnosis of Internet addiction is often complex. Unlike chemical dependency and substance abuse, the Internet offers several direct benefits as a technological advancement in our society and not a device to be criticized as addictive. Individuals can conduct research, perform business transactions, access libraries, communicate, and make vacation plans. Books have been written outlining the psychological as well as functional benefits of the Internet in our lives. By comparison, alcohol or drugs are not an integral or necessary part of our personal and professional lives nor do these substances offer any health benefit. With so many practical uses of the Internet signs of addiction can easily be masked or justified. Further, clinical assessments often cover relevant disorders for psychiatric conditions and addictive disorders. However, given its newness, symptoms of Internet addiction may not be revealed in an initial clinical interview. While self-referrals for Internet addiction are becoming more common, often the client does not present with complaints of computer addiction. People may initially present with signs of depression, bi-polar disorder, anxiety, or obsessive-compulsive tendencies, only for the treating professional to later discover signs of Internet abuse upon further examination (Shapiro et al. 2000). Therefore, diagnosing Internet addiction upon clinical interview can be challenging. It is important to understand the current definitions of Internet addiction to help treating professionals screen for patients for compulsive use of the Internet and the evolution of Internet addiction as a disorder as part of the assessment process.

1.1.2 The Evolution of Internet Addiction

While time is not a direct function in diagnosing Internet addiction, early studies suggested that those classified as dependent online users were generally excessive about their online usage, spending anywhere from 40 to 80 h/week on recreational or private use of the Internet with sessions that could last up to 20 h (Young 1998).

Sleep patterns were disrupted due to long Internet sessions where addicts often took caffeine pills to facilitate longer Internet sessions and suffered from fatigue, poor diet, poor exercise, work and/or school performance due to loss of sleep.

The best method to clinically detect compulsive use of the Internet is to compare it against criteria for other established addictions. Researchers have likened Internet addiction to syndromes similar to impulse-control disorders on the Axis I Scale in the DSM (APA 1994) and utilized various forms of DSM-IV based criteria to define it. Of the all the references in the DSM-IV, Pathological Gambling was viewed as most akin to this phenomenon. The Internet Addiction Diagnostic Questionnaire (IADQ) was the first screening measure developed for diagnosis (Young 1998) that conceptualized the criteria for the disorder as follows:

1. Do you feel preoccupied with the Internet (think about previous online activity or anticipate next online session)?
2. Do you feel the need to use the Internet with increasing amounts of time in order to achieve satisfaction?
3. Have you repeatedly made unsuccessful efforts to control, cut back, or stop Internet use?
4. Do you feel restless, moody, depressed, or irritable when attempting to cut down or stop Internet use?
5. Do you stay online longer than originally intended?
6. Have you jeopardized or risked the loss of significant relationship, job, educational or career opportunity because of the Internet?
7. Have you lied to family members, therapist, or others to conceal the extent of involvement with the Internet?
8. Do you use the Internet as a way of escaping from problems or of relieving a dysphoric mood (e.g., feelings of helplessness, guilt, anxiety, depression)?

Answers evaluated non-essential Internet usage such as for non-business or academically related use. Subjects were considered 'dependent' when answering endorsing five or more of the questions over a six-month period not associated with manic or hypomanic episodes. Associated features included neglect of routine duties or life responsibilities, social isolation, and being secretive about online activities or a sudden demand for privacy when online.

Throughout the late 1990s–2000s, the IADQ was widely used in studies on Internet addiction. As researchers adapted the IADQ, some made refinements to the instrument. Beard and Wolf (2001) recommended that all of the first five criteria be required for diagnosis of Internet addiction, since these criteria could be met without any impairment in the person's daily functioning. They also recommended that at least one of the last three criteria (e.g., criteria 6, 7, and 8) be required in diagnosing Internet addiction. These criteria impact the pathological Internet user's ability to cope and function (e.g., depressed, anxious, escaping problems), and also impact interaction with others (e.g., significant relationship, job, being dishonest with others). Other studies that empirically tested the IADQ found that using 3 or 4 criteria where just as robust in diagnosing Internet addiction as using 5 or more and suggested that the cutoff score of 5 criteria might be overly stringent (Dowling and Quirk 2009).

The most recent acceptance of Internet addiction is the inclusion of Internet Use Gaming Disorder in Sect. 1.3 of the DSM-V. Researchers had encouraged the inclusion of pathological Internet use as a disorder (e.g., Block 2008) given the volume of studies that identified it as a problem. The main concern was that various criteria had been used to diagnose and classify Internet addiction in the literature. Section 1.3 will include conditions that require further research before their consideration as formal disorders, as well as cultural concepts of distress, the names of individuals involved in DSM-V's development, and other information. As a new condition, including it in the DSM-V will provide a standardized set of criteria for future studies.

1.1.3 Internet Addiction Test

Beyond DSM criteria, the Internet Addiction Test (IAT) is the first validated instrument to assess Internet addiction (Widyanto and McMurren 2004). Studies have found that the IAT is a reliable measure that covers the key characteristics of problematic Internet use. The test measures the extent of client's involvement with the computer and classifies the addictive behavior in terms of mild, moderate, and severe impairment. The IAT can be utilized among outpatient and inpatient settings and adapted accordingly to fit the needs of the clinical setting.

The IAT is a worldwide accepted and validated testing instrument that examines symptoms of Internet addiction such as a user's preoccupation with Internet use, ability to control online use, extent of hiding or lying about online use, and continued online use despite consequences of the behavior. The IAT has been validated in France (Khazaal et al. 2008), Germany (Pawlikowski and Brand 2011), Norway (Johansson and Götestam 2004), Finland (Kaltiala-Heino et al. 2004; Korkeila et al. 2010), Italy (Ferraro et al. 2007), Greece (Siomos et al. 2008), Iran (Ghassemzadeh et al. 2008), Pakistan (Suhail and Bargees 2006), China (Lam et al. 2009), and Korea (Hur 2006). Tao et al. (2010) also proposed that a diagnostic score of 2 + 1, where the first two symptoms (preoccupation and withdrawal symptoms) and at least one of the five other symptoms (tolerance, lack of control, continued excessive use despite knowledge of negative effects/affects, loss of interests excluding internet, and use of the internet to escape or relieve a dysphoric mood) was established. This makes the IAT the first globally psychometric measure of the disorder.

1.2 Risk Factors for Internet Addiction

As Internet Use Disorder has gained credibility, more studies focused on risk factors associated with the development of the disorder. The risk factors can loosely be categorized as social factors, psychological factors, and biological factors, each will be further discussed.

1.2.1 Social Factors

Excessive or problematic Internet use often stems from interpersonal difficulties such as introversion or social problems (Ebeling-Witte et al. 2007). Often, Internet addicts fail to communicate well in face-to-face situations (Leung 2007). This is partly why they use the Internet in the first place. Communicating online seems safer and easier for them. Poor communication skills can also cause poor self-esteem, feelings of isolation and create additional problems in life, such as trouble working in groups, making presentations, or going to social engagements. Virtual relationships are a way of engaging with others while having the safety of avoiding rejection or the anxiety of making physical contact with others. Shyness can be consuming and the Internet offers an immediate relief the anxiety this causes. Therapy needs to address how addicts communicate offline and to establish positive new ways of interacting. Furthermore, in the context of the IAT, a recent study found inverse correlations between the IAT and self-directedness in a group of healthy participants from the population and first-person-shooter-video-players (Montag et al. 2011). A new study from this group shows that this effect can be found cross-cultural in seven countries (Sariyska et al. 2014).

Other research has focused on limited social support systems that Internet addicts have, which is in part why they turn to virtual relationships as a substitute for the missing social connection in their lives. They turn to others on the Internet when feeling lonely or need someone to talk with. Studies have found loneliness is associated with the development of Internet addiction (e.g., Hardie and Tee 2007; Morahan-Martin 1999). Loneliness as a risk factor is consistent with findings that suggest social relationships are a key component in the development of Internet addiction. The most addictive applications are chat rooms, interactive games, instant messaging, or social media, suggesting that the condition is socially motivated.

A more discrete social risk factor for Internet addiction is the development of online affairs (Whitty 2005). An online affair is a romantic or sexual relationship initiated via online contact and maintained predominantly through electronic conversations that occurs through email, chat rooms, or online communities (Atwood and Schwartz 2002). This again shows that interpersonal problems or loneliness can play an active role in developing an addiction to online communication and relationships. Here, marital problems and discord play a role but it is unclear to what extent. Do marital problems come first before establishing new romantic relationships online or does the anonymity of online relationships accelerate intimacy online? Or, does the accessibility of meeting others online create the opportunity for affairs to begin among otherwise stable or healthy marriages. New research is trying to address these questions.

1.2.2 Psychological Factors

There are two types of Internet addicts. The *Dual Diagnosed Internet Addict* suffers from prior psychological problems such as to depression, anxiety, obsessive-compulsive disorder, or substance abuse, to name a few syndromes associated with the

disorder. Other addicts, referred to as *New Internet Addicts*, have no prior history of psychiatric illness or addiction, and their addiction to the Internet is an entirely new problem. Dual Diagnosed Internet Addicts may suffer from a variety of illnesses that contribute to developing Internet addiction whereas the New Internet Addict do not have any psychiatric history but focus on particular activities or relationships online (a specific online affair, chat room, message board, game, gambling site, or adult site, to name a few examples). The disorder exists solely online (Young 2004).

Dual Diagnosis Internet Addicts suffer from depression (Ryu et al. 2004), social anxiety (Yen et al. 2007), impulsivity (Lavin et al. 1999), obsessive-compulsive disorders (Shapiro et al. 2000), and general psychiatric problems (Yen et al. 2008). Dual Diagnosed Internet Addicts suffer from alcohol or drug dependency only to find their compulsive use of the Internet a physically safe alternative to their addictive tendency (Young 2004). They believe that being addicted to the Internet is medically safer than being addicted to drugs or alcohol; at the same time, the compulsive behavior avoids the need to confront unpleasant feelings or situations underlying the addictive behavior.

Dual diagnosis in addiction is common. The Dual Diagnosed Internet Addict can be displayed in a variety of ways unique from other addictive syndromes. Research has not confirmed which is cause and effect but we have established a clear correlation between Internet addiction and psychiatric problems. For instance, we know that Internet addicts suffer from depression but it is hard to know which came first. Some suggest that because a person suffers from depression that he or she uses the Internet as a means to cope with sad feelings and low self-esteem associated with the disorder. The person goes online to forget about sad feelings as they escape into the Internet. It is also possible that as a person goes online with increased frequency, he or she may feel more depressed as they become socially isolated from others.

In another example, a person suffering from anxiety may seek out companionship in a safe virtual environment. In yet another example, a sexual compulsive discovers a new source for sexual gratification through online pornography and anonymous sex chat. The Internet allows them to continue their sexual behavior without the physical need to visit strip clubs or prostitutes and provides a new and socially acceptable way to cope. Realizing the impact of this destructive behavior, the person rationalizes it and continues to engage in the activity despite its known potential risks, including possible job loss, divorce, or arrest. The online experience turns into a relief from pain and anxiety, the reward for success, and a way to avoid addressing other painful emotions. The online world becomes a private refuge and while the Dual Diagnosed Internet Addict progressively retreats into the computer, it is unclear how psychiatric history plays a role.

New Internet Addicts meet two distinct criteria. First, they become addicted to new forms of Internet use created solely online such as chat rooms, social networks, instant messaging, role-playing games, or eBay. Someone who becomes addicted to chat rooms must use the Internet to chat. Someone who becomes addicted to eBay must use the Internet to access it. Granted, these activities have now become portable through mobile devices such iPhones, Droids, or iPads or cell phones. The key element is that they are all considered Internet-specific activities.

Secondly, New Internet Addicts are individuals with no previous significant addictive or psychiatric history. They develop an addiction to the anonymous, accessible,

and interactive nature of online use. For instance, New Internet Addicts may include a 50-year-old lawyer using sex chat rooms during work hours and without his wife's knowledge, a 30-year-old business executive compulsively checking his iPhone to check his match.com girlfriends, a 20-year-old college student constantly uses Facebook, or a 16-year-old boy constantly playing World of Warcraft with no other comorbidity. The compulsive Internet use is a new clinical phenomenon.

1.2.3 Biological Factors

The most recent research reflected in this book focuses on the biological studies associated with Internet addiction. I won't go into as much detail in this section as this book provides substantial depth in this new area of research. I will highlight a few notable studies that are very helpful to learn what causes Internet addiction. We know that psychological and social factors are associated with the development. We have little knowledge about the biological associations with this disorder. This is why these are important new studies that allow us to see the biology of Internet addiction and more broadly, the biology of addiction in general.

We have learned through functional magnetic resonance image (fMRI) analyzing the differences between addicts and non-addicts that brain regions such as the cerebellum, brainstem, right cingulate gyrus, bilateral parahippocampus, right frontal lobe (rectal gyrus, inferior frontal gyrus and middle frontal gyrus), left superior frontal gyrus, left precuneus, right postcentral gyrus, right middle occipital gyrus, right inferior temporal gyrus, left superior temporal gyrus and middle temporal gyrus are involved in the development of Internet addiction (Liu et al. 2010). This study was limited by studying college students and a low N of nineteen.

Along with fMRI studies, EEG studies were conducted that found that those subjects classified as Internet addicts had lower brain scan activation on a game playing procedure than the normal group. This effect was different for the event related potential components N2 and for the P3 amplitudes. They had to engage in more cognitive endeavors to complete the inhibition task in the late stage (Dong et al. 2010). The IAD students also showed less efficiency in information processing and lower impulse control than their normal peers but not behaviorally (only in the EEG signal).

Studies investigating brain gray matter density (GMD) demonstrated changes in adolescents with Internet addiction using voxel-based morphometry (VBM) analysis on high-resolution T1-weighted structural magnetic resonance images. Compared with healthy controls, Internet-addicted adolescents had lower GMD in the left anterior cingulate cortex, left posterior cingulate cortex, left insula, and left lingual gyrus (Zhou et al. 2011). Again, this study used a small sample and only college students. More meaningful data would be found with a larger and more diverse subject pool. One of the most promising new biological research interests is in the area of genetic markers. The researchers from the University of Bonn and

the Central Institute of Mental Health in Mannheim compared the genetic makeup of 132 problematic Internet users with that of 132 age—and sex-matched healthy control individuals (Montag et al. 2012). Results found that the 132 problem Internet users showed higher elevations of the CC genotype of rs1044396 (genetic variation of the nicotinic acetylcholine receptor gene) compared to controls. These neurotransmitters play a significant role in activating the brain's reward system.

Han et al. (2007) examined 79 adolescent male excessive Internet gamers and 75 age- and gender-matched healthy comparison adolescents. They used the reward-dependence (RD) scale in Cloninger's Temperament and Character Inventory and the frequencies of two dopamine polymorphisms: the DRD2/ANKK1 Taq Ia and COMT Val158Met polymorphisms. Their study found the excessive gamer group had significantly higher RD scores than controls. Within the EIGP group, the presence of the Taq1A1 allele correlated with higher RD scores and an increased prevalence of the DRD2 Taq1A1 and low activity COMT alleles. Lee et al. (2008) examined 91 male adolescents with excessive Internet use and 75 healthy comparison subjects. Between group comparisons were made on genetic polymorphisms of the serotonin transporter gene and with respect to harm avoidance (HA) of Cloninger's Temperament Character Inventory. Results found that the excessive Internet user group had higher prevalence of SS-genotypes, higher harm avoidance, and depression scores suggesting that excessive users may have genetic and personality traits similar to depressed patients.

1.3 Treatment Approaches

Use of the Internet is legitimate in business and home practice such as in electronic correspondence to vendors or electronic banking. Therefore, traditional abstinence models are not practical interventions when they prescribe banned Internet use in most cases. The focus of treatment consists of moderated Internet use. While moderated Internet use is the primary goal of treatment, abstinence of problematic applications is often necessary. Specific applications such as a particular game, a particular gambling site, or a particular sex site will trigger net-binges. Abstinence of the 'trigger' application is essential to help the client recover from the problematic application(s) while retaining controlled use over legitimate business Internet use.

Treatment includes a variety of interventions and a mix of psychotherapy theories to treat the behavior and address underlying psychosocial issues that are often co-existent with this addiction (e.g., social phobia, mood disorders, sleep disorders, marital dissatisfaction, or job burnout). To help clients abstain from problematic online applications, recovery interventions apply structured, measurable, and systematic techniques. The most commonly discussed therapies are Motivational Interviewing, Cognitive-Behavioral Therapy (CBT), and retreat or inpatient care.

1.3.1 Motivational Interviewing

The concept of motivational interviewing evolved from experience in the treatment of problem drinkers, and was first described by Miller (1983). These fundamental concepts and approaches were later elaborated by Miller and Rollnick (1991) in a more detailed description of clinical procedures. Motivational interviewing is a goal-directed style of counseling for eliciting behavior change by helping clients to explore and resolve ambivalence. Motivational interviewing involves asking open-ended questions, giving affirmations, and reflective listening.

Motivational interviewing is intended to confront the client in a constructive manner to evoke change, or using external contingencies such as the potential loss of a job or relationship, to mobilize a client's values and goals to stimulate behavior change. Clients dealing with addiction or substance abuse problems often feel ambivalent about quitting, even after they admit they have a problem. They fear the loss of the Internet, they fear what life might be like if they were unable to chat with online friends, engage in online activities, and use the Internet as a form of psychological escape. Motivational interview helps clients confront their ambivalence.

Typical interview questions may include: How many hours per week do you currently spend online (for non-essential use)? What applications do you use on the Internet (specific sites/groups/games visited)? How would you rank order each application from best to least important? (1 = first, 2 = second, 3 = third, etc.)? What do you like best about each application? What do you like the least? How has the Internet changed your life? How do you feel when you log offline? What problems or consequences have stemmed from your Internet use? (If this answer is difficult for the client to describe, have the client keep a log near the computer in order to document such behaviors for the next week's session)? Have others complained about how much time you spend online?

The answers to these questions create a clearer clinical profile of the client. The therapist can determine the types of applications that are most problematic for the client (i.e., chat rooms, online gaming, online pornography, etc.). The length of Internet use, the consequences of the behavior, a history of prior treatment attempts, and outcomes for any treatment attempts are also assessed. This helps clients begin the process of examining how the Internet impacts their lives.

It is helpful for the client to gain a sense of responsibility for his or her behavior. By allowing the client to resolve their ambivalence in a manner that gently pushes them, helps the client to be more inclined to acknowledge the consequences of their excessive online use and engage in treatment. Generally, the style is quiet and eliciting rather than aggressive, confrontational, or argumentative. For the therapists accustomed to confronting and giving advice, motivational interviewing can appear to be a hopelessly slow and passive process. The proof is in the outcome. More aggressive strategies, sometimes guided by a desire to "confront client denial," easily slip into pushing clients to make changes for which they are not ready.

Helping the client explore how he or she feels just before going online will help pinpoint the types of emotions being covered by the behavior (or how the client is using the Internet to cope or escape from problems). Answers may include issues such as a fight with a spouse, depressed mood, stress at a job, or a poor grade in school. Motivational interviewing should explore how these feelings diminish when online, looking for how the client rationalizes or justifies using the Internet (e.g., chatting makes me forget about the fight with my husband, looking at online porn makes me feel less depressed, gambling online makes me feel less stressed at work, killing other players in an online game makes me to feel better about my poor grade at school). Motivational interviewing is also meant to help the client recognize consequences stemming from excessive or compulsive use. Problems may consist of issues like my spouse becomes angrier, my feelings return when I turn off the computer, my job still stinks, I will lose my scholarship if I don't get my grades up. The therapeutic relationship is more like a partnership or companionship than expert/recipient roles to examine and resolve ambivalence. The operational assumption in motivational interviewing is that ambivalence is the principal obstacle to be overcome in triggering change. Overall, the specific strategies are designed to elicit, clarify, and resolve ambivalence in a client-centered and respectful therapeutic manner.

1.3.2 Cognitive-Behavior Therapy

Researchers have considered Internet addiction as a new impulse control disorder and have suggested using cognitive behavioral therapy (CBT) to treat the condition. However, given the daily dependency our society has on the Internet and technology in general unlike other impulse control issues, a specialized kind of CBT called treatment Cognitive-Behavioral Therapy for Internet Addiction (CBT-IA; Young 2011) was developed. In treating Internet addiction, abstinence recovery models are not practical as computers have become such a salient part of our daily lives. Research has found cognitive distortions are most associated with Internet addiction (e.g., Caplan 2002; Davis 2001; LaRose et al. 2001; Young 2007). CBT-IA was developed to address these cognitions. CBT-IA is a three phase approach that initially involves behavior modification to control Internet use, cognitive restructuring to challenge and modify cognitive distortions, and harm reduction therapy to address co-morbid issues.

Behavior therapy is used in the first phase of treatment to examine both computer behavior and non-computer behavior. Computer behavior deals with actual online usage, with a primary goal of abstinence from problematic applications, while retaining controlled use of the computer for legitimate purposes. Internet addicts feel a sense of displacement when online and were unable to manage central aspects of their lives due to their growing preoccupation with online use (Young 2004). They start to miss important deadlines at work, spend less time with their family, and slowly withdraw from their normal routines. They neglect

social connections with their friends, coworkers, and with their communities, and, ultimately, their lives become unmanageable because of the Internet. They become consumed with their Internet activities, preferring online games, chatting with online friends, or gambling over the Internet, and ignoring family and friends in exchange for solitary time in front of the computer (Leung 2007). Managing their time online and offline is an initial goal of CBT-IA (Young 2011).

In the second phase, the rationalizations that justify excessive online use are identified, challenged, and modified. These cognitions serve as triggers for addictive behavior. For instance, Internet addicts often ruminate about their self-worth in the real world and form extreme self-concepts favoring the online self (e.g., "I am worthless offline, but in the online world I am someone important"). A gamer creates an avatar (an online game character) who achieves greater levels of success in the game so he thinks the real world is less desirable or fears that he is not as important or interesting offline. A woman who feels inadequate with meeting men offline creates an online persona where she is popular with the men online. CBT-IA uses cognitive restructuring to break this pattern. Cognitive restructuring puts the client's thoughts "under the microscope" by challenging him or her and re-scripting the negative thinking that lies behind him or her. In doing so, CBT-IA can help clients understand that they are using the Internet to avoid situations or feelings. Our moods are driven by what we tell ourselves, and this is usually based on our interpretations of our environment. Cognitive restructuring helps clients re-evaluate how rational and valid these interpretations are and find ways of achieving those same feelings offline.

Harm Reduction Therapy (HRT; Marlatt et al. 2001) is used in the third and final phase of treatment for continued recovery and relapse prevention. HRT can be used to identify and treat psychiatric issues co-existing with compulsive Internet use and/or social issues in immediate family and/or marital relationships. HRT addresses any co-existing factors associated with the development of Internet addiction. These factors can include personal, situational, social, psychiatric, or occupational issues. Often, addicts falsely assume that just stopping the behavior is enough to say, "I am recovered." Full recovery is more than simply refraining from the Internet. According to CBT-IA, complete recovery means resolving the underlying issues associated with the addiction; otherwise, relapse is likely to occur.

1.3.3 Inpatient Care and Retreat Centers

In the US, ReStart at www.netaddictionrecovery.com is one of the retreat centers specializing in problematic Internet use, video game, and technology use. They have a multidisciplinary team that works with clients in a 45-day residential care program through individualized assessments, treatment of co-occurring mental health concerns, group counseling and psychotherapy, life skills, mentoring and vocational coaching, 12-step meetings and spiritual recovery. Participants stay at Heavensfield Retreat Center in rural Fall City, Washington in the Pacific Northwest.

In China, the country has led much of the research in the Internet addiction field and established the first Internet Addiction Center in 2006, a military-run boot camp in Beijing (Jiang 2009). Tao Ran, director of the treatment center and a colonel in the People's Liberation Army (PLA), helped come up with a strict definition of Internet addiction last fall: consecutive usage of the Web for 6 h a day for three straight months is addiction. Surprisingly, almost 30 % of Chinese match this definition and more clinics have emerged. Life in the treatment camp is defined by strict, semi-military disciplines. Patients get up at 6:30 a.m. and go to bed at 9:30 p.m. Their daily schedule includes military drills, therapy sessions, reading and sports. While rigorous and controversial, outcome studies do not exist to show the efficacy of the camps.

In Korea, the most wired nation on earth has devoted the most resources to Internet addiction recovery. Perhaps no other country has so fully embraced the Internet. 90 % of homes connect to cheap, high-speed broadband, online gaming is a professional sport, and social life for the young revolves around the "PC bang," dim Internet parlors that sit on practically every street corner. But such ready access to the Web has come at a price as legions of obsessed users find that they cannot tear themselves away from their computer screens.

To address the problem, the government has built a network of 140 Internet-addiction counseling centers, in addition to treatment programs at almost 100 hospitals and the Internet Rescue camp, a forested area about an hour south of Seoul, was created to treat the most severe cases. The camp is entirely paid for by the government, making it tuition-free (Sang-Hun 2010).

Korea has been the most progressive of any country in its efforts to prevent and treat Internet addiction. To counter what is perceived as an epidemic, the government introduced a so-called "Shutdown Law", which blocks gamers under 16 from playing between midnight and 6 a.m. But its effect has been limited as teens circumvent the restrictions by using their parents' accounts (Kim and Shin 2013). The law has been semi-effective and a new trend has been suggested to enter these young people into the Riding Healing Center, a therapy organization that uses horse-riding to cure emotional and behavioral disorders, which it believes are an underlying cause of Internet addiction. The Korean Riding Association has two therapy centers and about 50 people a day go through its programs to treat a range of issues such as depression, attention hyperactivity deficit disorder (ADHD) and Internet addiction. While no outcome studies exist to their effectiveness, the association plans to build 30 more centers across South Korea, which has a population of 50 million, by 2022 to meet the rising demand for its therapy.

1.4 Final Thoughts

This chapter presents a brief overview of the studies that have been conducted on Internet addiction. Since the earlier studies in 1996, the field has grown dramatically. This chapter reviews the current diagnosis involved in detecting Internet

addiction and the general set of risk factors associated with the condition. As this book focuses on the neuroscience of Internet addiction, it shows that the disorder has gained extensive credibility over the years and that new research such as this offer great opportunity to understand the underpinnings of the problem.

While not everyone who uses the Internet becomes addicted, findings show that Internet addiction is a global problem that transcends culture, race, age, and gender. As children and teenagers go online at younger ages, new risks are created and we currently know little about the lasting impact of online technologies on brain development. We may inadvertently be endangering children without realizing this impact by introducing technology at younger ages.

The research contained in this book will enable us to fully realize the potential neuroscientific impact of new technologies. This research helps us learn new diagnostic techniques for early detection. Neuroscientific studies on Internet addiction enable new psychopharmacological treatment of Internet Addiction as we learn more about the biological basis of the condition. This research helps guide the mental health field in developing new therapeutic interventions in the treatment of Internet Addiction and government agencies to develop comprehensive policies to assist in the prevention and education of Internet addiction.

The field is still in its infancy. As we search for a clearer understanding of the behavioral and the neurologic factors influencing the condition of addictive or compulsive use of the Internet. We have documented the ramifications of the disorder on social, personal, and occupational functioning. With continued work in the field, studies in structural brain imagining, functional MRIs, and molecular genetics not only assist in advancing Internet addiction research but it helps in understanding the similarities and differences among addictive syndromes overall.

References

American Psychiatric Association (1994) Diagnostic and statistical manual of mental disorders (DSM). APA, Washington D.C

Atwood JD, Schwartz L (2002) Cyber-sex: the new affair treatment considerations. J Couple Relat Ther 1:37–56

Beard KW, Wolf EM (2001) Modification in the proposed diagnostic criteria for Internet addiction. CyberPsychology Behav 4:377–383

Block JJ (2008) Issues for DSM-V: internet addiction. Am J Psychiatry 165:306–307

Caplan SE (2002) Problematic Internet use and psychosocial well-being: development of a theory-based cognitive-behavioral measurement instrument. Comput Hum Behav 18:553–575

Davis RA (2001) A cognitive behavioral model of pathological internet use. Comput Hum Behav 17:187–195

Dong G, Lu Q, Zhou H, Zhao X (2010) Impulse inhibition in people with internet addiction disorder: electrophysiological evidence from a Go/NoGo study. Neurosci Lett 485:138–142

Dowling NA, Quirk KL (2009) Screening for Internet dependence: do the proposed diagnostic criteria differentiate normal from dependent internet use? CyberPsychology Behav 12:21–27

Ebeling-Witte S, Frank ML, Lester D (2007) Shyness, Internet use, and personality. CyberPsychology Behav 10:713–716

Ferraro G, Caci B, D'Amico A, Di Blasi M (2007) Internet addiction disorder: an Italian study. CyberPsychology Behav 10:170–175

Ghassemzadeh L, Shahraray M, Moradi A (2008) Prevalence of Internet addiction and comparison of internet addicts and non-addicts in Iranian High Schools. Cyberpsychology Behav 11:731–733
Han DH, Lee YS, Yang KC et al (2007) Dopamine genes and reward dependence in adolescents with excessive internet video game play. J Addict Med 1:133–138
Hardie E, Tee MY (2007) Excessive internet use: the role of personality, loneliness and social support networks in internet addiction. Aust J Emerg Technol Soc 5:34–47
Hur MH (2006) Internet addiction in Korean teenagers. CyberPsychology Behav 9:14–525
Jiang J (2009) Inside China's fight against internet addiction. In: Time. Available via: http://www.time.com/time/world/article/0,8599,1874380,00.html
Johansson A, Götestam KG (2004) Internet addiction: characteristics of a questionnaire and prevalence in Norwegian youth (12–18 years). Scand J Psychol 45:223–229
Kaltiala-Heino R, Lintonen T, Rimpelä A (2004) Internet addiction? Potentially problematic use of the internet in a population of 12 to 18 year old adolescents. Addict Res Theory 12:89–96
Khazaal Y, Billieux J, Thorens G et al (2008) French validation of the internet addiction test. CyberPsychology Behav 11:703–706
Kim D, Shin E (2013) Horses to the rescue of Korea's internet-addicted teens. In: Reuters. Available via: http://www.reuters.com/article/2013/01/11/us-korea-internet-horses-idUSBRE90A14G20130111. Accessed on 3 Jan 2015
Korkeila J, Kaarlas S, Jääskeläinen M et al (2010) Attached to the web—harmful use of the internet and its correlates. Eur Psychiatry 25:236–241
Lam LT, Peng Z, Mai J, Jing J (2009) Factors associated with internet addiction among adolescents. Cyberpsychology Behav 12:551–555
LaRose R, Mastro D, Eastin MS (2001) Understanding internet usage. A social-cognitive approach to uses and gratifications. Soc Sci Comput Rev 19:395–413
Lavin M, Marvin K, McLarney A et al (1999) Sensation seeking and collegiate vulnerability to internet dependence. CyberPsychology Behav 2:425–430
Lee YS, Han DH, Yang KC et al (2008) Depression like characteristics of 5HTTLPR polymorphism and temperament in excessive internet users. J Affect Disord 109:165–169
Leung L (2007) Stressful life events, motives for Internet use, and social support among digital kids. CyberPsychology Behav 10:204–214
Liu J, Gao XP, Osunde I et al (2010) Increased regional homogeneity in internet addiction disorder a resting state functional magnetic resonance imaging study. China Med J 123:1904–1908
Marlatt GA, Blumne AW, Parks GA (2001) Integrating harm reduction therapy and traditional substance abuse treatment. J Psychoactive Drugs 33:13–21
Miller WR (1983) Motivational interviewing with problem drinkers. Behav Psychother 11:147–172
Miller WR, Rollnick S (1991) Motivational interviewing: preparing people to change addictive behavior. Guilford Press, New York
Montag C, Flierl M, Markett S et al (2011) Internet addiction and personality in first-person-shooter video gamers. J Media Psychol Theor Methods Appl 23:163–173
Montag C, Kirsch P, Sauer C, Markett S, Reuter M (2012) The role of the CHRNA4 gene in internet addiction: a case-control study. J Addict Med 6:191–195
Morahan-Martin J (1999) The relationship between loneliness and internet use and abuse. CyberPsychology Behav 2:431–439
Pawlikowski M, Brand M (2011) Excessive Internet gaming and decision making: do excessive World of Warcraft players have problems in decision making under risky conditions? Psychiatry Res 188:428–433
Ryu EJ, Choi KS, Seo JS, Nam BW (2004) The relationships of internet addiction, depression, and suicidal ideation in adolescents. J Korean Acad Nurs 34:102–110
Sang-Hun C (2010) South Korea expands aid for internet addiction. New York Times. Available via: http://www.nytimes.com/2010/05/29/world/asia/29game.html?_r=0. Accessed ???

Sariyska R, Reuter M, Bey K et al (2014) Self-esteem, personality and Internet addiction: a cross-cultural comparison study. Personality Individ Differ 61–62:28–33
Shapiro NA, Goldsmith TD, Keck PE et al (2000) Psychiatric evaluation of individuals with problematic internet use. J Affect Disord 57:267–272
Siomos KE, Dafouli ED, Braimiotis DA et al (2008) Internet addiction among Greek adolescent students. Cyberpsychology Behav 11:653–657
Suhail K, Bargees Z (2006) Effects of excessive internet use on undergraduate students in Pakistan. CyberPsychology Behav 9:297–307
Tao R, Huang X, Wang J et al (2010) Proposed diagnostic criteria for internet addiction. Addiction 105:556–564
Whitty M (2005) The realness of cybercheating. Soc Sci Comput Rev 23:57–67
Widyanto L, McMurren M (2004) The psychometric properties of the internet addiction test. CyberPsychology Behav 7:445–453
Yen JY, Ko CH, Yen CF et al (2007) The comorbid psychiatric symptoms of internet addiction: attention deficit and hyperactivity disorder (ADHD), depression, social phobia, and hostility. J Adolesc Health 41:93–98
Yen JY, Ko CH, Yen CF et al (2008) Psychiatric symptoms in adolescents with internet addiction: comparison with substance use. Psychiatry Clin Neurosci 62:9–16
Young KS (1998) Internet addiction: the emergence of a new clinical disorder. CyberPsychology Behav 1:237–244
Young KS (2004) Internet addiction: the consequences of a new clinical phenomena. In: Doyle K (ed) American behavioral scientist: psychology and the new media. Sage, Thousand Oaks, pp 1–14
Young KS (2007) Cognitive-behavioral therapy with internet addicts: treatment outcomes and implications. CyberPsychology Behav 10:671–679
Young KS (2011) CBT-IA: the first treatment model to address internet addiction. J Cognitive Therapy 25:304–312
Zhou Y, Lin FC, Du YS et al (2011) Gray matter abnormalities in internet addiction: a voxel-based morphometry study. Eur J Radiol 79:92–95