MENTAL HEALTH IN THE DIGITAL AGE
GRAVE DANGERS, GREAT PROMISE

Edited by
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and
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Contents

ix Contributors
xiii Introduction

Section I Challenges
3 Chapter 1. Problematic Internet Use: An Overview by Aviv Weinstein and Elias Aboujaoude
27 Chapter 2. An Overview of Problematic Gaming by Mark D. Griffiths, Orsolya Király, Halley M. Pontes, and Zsolt Demetrovics
46 Chapter 3. Assessment of Problematic Internet Use and Online Video Gaming by Orsolya Király, Katalin Nagygörgy, Beatriz Koronczai, Mark D. Griffiths, and Zsolt Demetrovics
69 Chapter 4. Neurobiological Aspects of Problematic Internet and Video Game Use by Sun Mi Kim and Doug Hyun Han
86 Chapter 5. Video Game Violence and Offline Aggression by Christopher L. Groves and Craig A. Anderson
118 Chapter 7. Cyberbullying: A Mental Health Perspective by Matthew W. Savage, Sarah E. Jones, and Robert S. Tokunaga
135 Chapter 8. Life Versus Death: The Suicidal Mind, Online by Keith M. Harris

Section II Opportunities
155 Chapter 9. Psychoeducation and the Internet by Nicola J. Reavley and Anthony F. Jorm
176 Chapter 10. Internet-Based Psychotherapy by Gerhard Andersson
196 Chapter 11. Software-Based Psychotherapy: The Example of Computerized Cognitive-Behavioral Therapy by Lina Gega and Simon Gilbody
220 Chapter 12. Virtual Reality in Exposure Therapy: The Next Frontier by Eric Malbos

267 Index
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Psychoeducation and the Internet

Nicola J. Reavley and Anthony F. Jorm

INTRODUCTION

Current estimates suggest that more than 2.7 billion people have access to more than 860 million sites on the Internet (International Telecommunications Union, 2013; Netcraft, 2014). As many as 80% of Internet users in developed countries use the Internet to search for health information, typically seeking information on conditions, symptoms, diseases, and treatments (Shuyler and Knight, 2003; Pew Internet & American Life Project, 2011). Web-based information on psychiatric disorders is provided by governments, nonprofit organizations, corporations, and private individuals, and it is commonly accessed by those with a psychiatric diagnosis or their caregivers (Powell and Clarke, 2006; Ybarra and Suman, 2006; Khazaal et al., 2006a). Such information can typically be provided at little to no cost and for anyone with an Internet connection, the information is easily accessible and can be viewed anonymously, which may be important for those concerned about the stigmas surrounding psychiatric disorders.

The relatively rapid increase in the amount of health information on the Internet has been closely followed by discussions about its quality and the impact that poor quality information might have on the health of those who access it. In the area of psychiatric disorders, poor quality information may increase the risk that someone who needs treatment might delay or avoid it, use inappropriate or ineffective treatments, or not adhere to treatment.

This chapter aims to outline the role of the Internet in the provision of psychoeducation in mental health. It seeks to explore the following questions:

- Is web-based information on psychiatric disorders of good quality?
- How can consumers be guided to better quality sites?
- Do quality information websites change knowledge, attitudes, and behavior?
The chapter is largely based on reviews of studies of web-based information on a range of psychiatric disorders, mainly those published in English (Reavley and Jorm, 2010). It also draws on studies that have attempted to assess the effectiveness of web-based psychoeducation interventions that typically cover information on signs and symptoms of mental illness, treatments, self-help behaviors, and where to seek help. These interventions may also incorporate skills training designed to reduce symptoms and promote healthy behaviors. This chapter focuses on the effectiveness of psychoeducation interventions in improving knowledge about mental health problems and behaviors that affect mental health, with a particular emphasis on interventions aimed at members of the general community, either because they are experiencing mental health problems themselves or are in contact with someone who is. It does not address interventions that aim to have a direct impact on symptoms of psychiatric disorders, such as Internet therapy (see Chapter 10); interventions accessed via clinical services; or universal prevention interventions, such as those carried out in schools and colleges.

**IS WEB-BASED INFORMATION ON PSYCHIATRIC DISORDERS OF GOOD QUALITY? REVIEW OF RESEARCH**

**Methods of Assessing Quality**

Since the late 1990s, researchers have conducted studies to assess the quality of web-based information on a wide range of health topics. Eysenbach et al. (2002) reviewed these studies and reported that 70% considered quality a problem. However, there is evidence that accuracy varies between health domains, with these authors noting that up to 90% of diet and nutrition information was unreliable compared to only 5% of the information on cancer.

There have been various methods of assessing information quality, with the early focus on accountability defined by Silberg et al. (1997) as including the following: authorship (authors, affiliations, and credentials clearly identified), attribution (sources and references mentioned), disclosure (ownership of the site and sponsorship disclosed), and currency (whether the site has been modified in the past month and year and whether the date the site was created or modified was specified). Since then, other assessment measures have been developed and, although these vary, most cover one or more of the following: accuracy, completeness, readability, accountability, and design and technical criteria (Jadad and Gagliardi, 1998; Eysenbach et al., 2002). The methods can be broadly divided into rating instruments to be used by experts, checklists that can be used by consumers (e.g., the DISCERN, a 16-item checklist designed to assist consumers in assessing the quality of health information; Charnock et al., 1999), codes of conduct or badges of quality that can be displayed on sites (e.g., Health in the Digital Age), and automated ratings (e.g., Google PageRank). Table 9.1 provides a description of rating methods.

A review of studies of the quality of web-based information on a range of psychiatric disorders found that there were variations in the methods used to assess website quality in terms of site selection and rating methods (Reavley and Jorm, 2010). Some studies assessed all available websites that met their criteria, which varied according to the study, whereas others limited their assessment to the top 10, 20, or 50 results given by common search engines.

A number of website quality studies also incorporated the development of rating instruments. In the studies described below, rating was most commonly done through expert assessment (with rating by two or more experts) or with the use of rating instruments. However, such instruments are rarely validated and many are used only once. Jadad and Gagliardi (1998) reviewed 47 Internet health information rating instruments, none of which provided information on the interobserver reliability and construct validity of the measurements. In a follow-up study, 98 instruments were identified; of 51 newly identified rating instruments, only 5 provided some information by which they could be evaluated and none were validated (Gagliardi and Jadad, 2002). This limits the ability to draw conclusions from such studies.

**General Mental Health Information**

Three studies assessed the overall quality of mental health information on the Internet. Nemoto et al. (2007) assessed the quality of Japanese language websites covering psychiatric disorders in 2005. They used the DISCERN and also assigned a global score. Their results showed that information on mood disorders, panic disorder, and schizophrenia was most common and concluded that the quality of information was mostly inadequate, especially regarding treatment.

In a study comparing user-contributed information about depression and schizophrenia on Wikipedia with centrally controlled online information sources, Encyclopaedia Britannica, and a psychiatry textbook, Reavley et al. (2012) assessed online content on 10 relevant topics from 14 frequently accessed websites (including Wikipedia). The content was rated by experts according to the following criteria: accuracy, up-to-dateness, breadth of coverage, referencing, and readability. The authors concluded that the quality of information on depression and schizophrenia on Wikipedia was generally as good as, or better than, that provided by centrally controlled websites, Encyclopaedia Britannica, and a psychiatry textbook.

In the most recent study, Grohol et al. (2014) reviewed the overall quality of mental health information searched for online. They used 11 common mental health terms and identified the first 20 search results of the search engines Google and Bing. The analysis included 440 web pages using the DISCERN instrument, an adaptation of the Depression Website Content Checklist, Flesch Reading Ease, and Flesch-Kincaid Grade Level readability measures, HON Code badge display, and commercial status. Results showed that the information quality was higher for schizophrenia, bipolar disorder, and dysphoria, and lower for phobia, anxiety, and panic disorder websites. These researchers concluded that 67.5% of websites had
<table>
<thead>
<tr>
<th>Rating Method</th>
<th>Description</th>
<th>Studies Using This Method</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Validated checklists for use by nonexperts/consumers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DISCERN</td>
<td>16-item checklist designed to assist consumers to assess the quality of health information</td>
<td>Griffiths et al. (2002); Griffiths and Christensen (2005); Serdobbel et al. (2006); Iger et al. (2007); Nemoto et al. (2007); Akram et al. (2008); Khazaal et al. (2008a,c); Meo et al. (2008); Barnes et al. (2009); Zermatten et al. (2010); Thakor et al. (2011); Pusti et al. (2012); Kilia et al. (2013); Grohol et al. (2014)</td>
</tr>
<tr>
<td>Silberg score</td>
<td>9-item measure of accountability (Silberg et al., 1997)</td>
<td>Griffiths and Christensen (2000); Kiseley et al. (2003); Murphy et al. (2004); Khazaal et al. (2008b,c,d,e); Moore et al. (2008); Zermatten et al. (2010); Kilia et al. (2013)</td>
</tr>
<tr>
<td>Interactivity score</td>
<td>4-item measure of interactivity (including interactivity, audio or video support, supporting bodies, and the ability to send queries (Abbott, 2000)</td>
<td>Khazaal et al. (2008b,c,d,e); Moore et al. (2008); Zermatten et al. (2010); Kilia et al. (2013)</td>
</tr>
<tr>
<td>Abbot esthetic criteria</td>
<td>4-item measure of esthetics (subheadings, diagrams, hyperlinks (Abbott, 2000)</td>
<td>Khazaal et al. (2008b,c,d,e); Moore et al. (2008); Zermatten et al. (2010); Kilia et al. (2013)</td>
</tr>
<tr>
<td>Flesch reading ease score</td>
<td>Measure of readability (available through Microsoft Word)</td>
<td>Akram et al. (2008); Khazaal et al. (2008b,c,d,e); Moore et al. (2008); Zermatten et al. (2010); Kilia et al. (2013); Grohol et al. (2014)</td>
</tr>
<tr>
<td>Flesch-Kincaid reading grade education scores</td>
<td>Rates text based on US school years or grade levels (available through Microsoft Word)</td>
<td>Berland et al. (2001); Kiseley et al. (2003); Khazaal et al. (2008b,c,d,e); Moore et al. (2008); Zermatten et al. (2010); Reesley et al. (2012); Kilia et al. (2013); Grohol et al. (2014)</td>
</tr>
<tr>
<td>DARTS tool</td>
<td>5-item quality assessment tool (Narhi et al., 2008)</td>
<td>Pusti et al. (2012)</td>
</tr>
</tbody>
</table>

**B. Rating instruments used by content experts**

- Global score
- Standardized pro forma
- Content quality scores
- Bipolar Website Quality Checklist (BWQC)
- Grounded theory methodology
- Strathclyde Website Evaluation Form
- Depression Website Content Checklist
- Scoring form for the quality of websites about eating disorders

**C. Codes of conduct**

- HON Code
  - Health on the Net Foundation (2010)

**D. Automated assessment**

- Computer algorithm for the automated assessment of quality of evidence-based treatment information
- Google page rank

- Griffiths et al. (2005)
good or better quality content but that additional work needs to be done to make many of the sites more readable.

**Depression**

The largest number of studies—10—assessing the quality of online mental health information focused on depression (Christensen et al., 2000; Griffiths and Christensen, 2000, 2002, 2005; Berland et al., 2001; Lissman and Boehlein, 2001; Griffiths et al., 2005; Stjernsward and Ostman, 2007; Ferreira-Lay and Miller, 2008; Zermatten et al., 2010). Methods of assessing quality varied, with the Silberg scale, which assesses accountability (Silberg et al., 1997), and the DISCERN (Charnock et al., 1999) being the most commonly used tools. The most recent study concluded that overall information quality was good (Zermatten et al., 2010), whereas studies conducted in earlier years were more likely to report overall poor quality (Griffiths and Christensen, 2000, 2002, 2005; Berland et al., 2001; Lissman and Boehlein, 2001). There was some evidence of higher quality information from websites of government, professional, and charitable organizations (Lissman and Boehlein, 2001; Ferreira-Lay and Miller, 2008).

Two studies assessed the quality of English and Finnish information on antidepressant drugs. Prusti et al. (2012) reported that no website provided information about all aspects of antidepressant treatment, but few provided incorrect information. The other study found that the sites WebMD and FamilyDoctor.org were of the highest quality, whereas pharmaceutical company sites were of lower quality (Morgan and Montague, 2011).

**Substance Use Disorders**

Four studies assessed the quality of information on substance use disorders. They included studies of the French language information on alcohol dependence (Coquard et al., 2008, 2011), information on cannabis addiction (Khasaaz et al., 2008b), and information on cocaine addiction (Khasaaz et al., 2008d). All studies concluded that information quality was poor. Another study of the US college online alcohol policy information concluded that information accessibility had improved between 2002 and 2007 (Faden et al., 2009).

**Bipolar Disorder**

Three studies assessed quality of information on bipolar disorder, with two studies assessing English language information and concluding that the overall quality of information was good (Mored et al., 2008; Barnes et al., 2009). A study of German language information concluded that comprehensive information on the nature of the illness was more frequent in sites resulting from the search term "manic-depressive disorder," whereas the term "bipolar disorder" produced more results offering information on evidence-based therapeutic strategies (Seyringer et al., 2007).

**Anxiety Disorders/Trauma**

Five studies assessed information on anxiety disorders or trauma. These included information on a range of anxiety disorders (Ipsen et al., 2007), social phobia (Khasaaz et al., 2008b), and Dutch language information on obsessive-compulsive disorder (OCD) (Serdooef et al., 2006). All studies concluded that quality was poor. In a more recent study, Kilia et al. (2013) assessed the quality of information on OCD and concluded that this was relatively good.

Brenner et al. (2006) assessed the quality of websites related to the topic of psychological trauma. They concluded that such sites were often not useful and sometimes provided inaccurate and potentially harmful information.

**Schizophrenia/Psychosis**

Two studies assessed the quality of information on schizophrenia/psychosis. One assessed German websites and found that evidence-based medical information was provided by more than one-half of the sites resulting from the search term "schizophrenia" and by less than one-third of "psychosis" hits (Schranke et al., 2006). The other study, which assessed the quality of information on schizophrenia treatment, concluded that accountability, presentation, and readability were poor (Kisely et al., 2003).

**Eating Disorders**

Four studies assessed the quality of websites giving information on diet or eating disorders, with all reporting that the overall quality of information was of poor or variable quality and that websites did not adequately address diagnostic criteria or treatment options (Murphy et al., 2004; Guardiola-Wanden-Bergeh et al., 2011; Perdaens and Pieters, 2011; Smith et al., 2011). Guardiola-Wanden-Bergeh et al. (2010) assessed content quality and the relationship with authorship and/or affiliation in blogs covering the topic of eating disorders. Their results showed that indication of authorship (as opposed to anonymity) and affiliation to an institution were associated with higher quality.

**Attention Deficit Hyperactivity Disorder**

Two studies assessed the quality of information on attention deficit hyperactivity disorder (ADHD). Akram et al. (2008) concluded that the information was basic and incomplete and that websites by government and professional bodies were better than those in other categories. Kisely et al. (2003) reported that accountability, presentation, and readability were poor and that agreement with evidence-based practice was low. Sites scoring in the top 10% for quality were significantly more likely to be owned by an organization or have an editorial board than those in the bottom 10%.
Other Disorders and Treatments

Other studies have assessed the quality of information on pathological gambling (Khazaal et al., 2008b), female hyposexual desire (Touchet et al., 2007), St. John’s wort (Martin-Facklam et al., 2002; Thakor et al., 2011), postpartum mental health (Moore and Ayers, 2011), and dementia (Sonnen et al., 2005). All studies reported that quality was generally poor. Reichow et al. (2012a) assessed the quality of information on autism, concluding that government websites were of higher quality than those offering a product or service.

Variation in Quality Across Mental Health Topics

Quality of information appears to be somewhat related to the topic. The highest quality information appears to be that relating to bipolar disorder, with two studies concluding that information was generally of good quality (Morel et al., 2008; Barnes et al., 2009). The most recent study of the quality of online depression information concluded that this was relatively good (Zermatten et al., 2010). However, information on other mental health topics was generally considered to be of poor quality.

Is Quality Improving?

Studies reviewing the quality of affective disorder information were carried out between 2000 and 2010. Although earlier studies generally concluded that information quality was poor, the four most recent studies, two of which assessed information on bipolar disorder, reported that the overall quality of website information was good (Ferreira-Lay and Miller, 2008; Morel et al., 2008; Barnes et al., 2009; Zermatten et al., 2010). Study methodology and quality indicators differed across the studies, but there is some evidence that information quality has been improving over time, particularly in the case of more frequently assessed topics.

Methods of Improving Quality

Despite the concerns about the quality of health information on the Internet, there is no clear agreement about the best way to improve this. Quality improvement methods include labeling and filtering information and the development of codes of conduct and seals of approval (Eysenbach and Diepgen, 1998; Wilson, 2002). Although some codes of conduct have been developed and graphic images denoting an award or approval seal appear on some websites, enforcement of breaches and the lack of consistent, universal, and well-recognized manner of indicating high-quality websites present barriers to implementation (Wilson, 2002). A number of other technological solutions have been proposed (e.g., the use of web browser encryption icons and automated quality assessments), but these also face significant barriers (Riska and Petersen, 2002; O’Grady, 2006).

In an attempt to assess the effect of feedback on website quality improvement, Jorm et al. (2010) assigned a score to 52 suicide prevention websites based on expert consensus guidelines. Administrators of half of the websites received feedback on how to improve the sites, and the other half did not receive such feedback. The feedback took the form of a letter headed “University of Melbourne Project to Evaluate and Improve Suicide Prevention Websites” and included a large university logo at the top to add authority. Websites were evaluated again 6 months later, and it was found that feedback did not lead to improvement.

HOW CAN CONSUMERS BE GUIDED TO BETTER QUALITY SITES?

As already noted, the Silberberg scale (Silberberg et al., 1997) and the DISCERN (Charnock et al., 1999) were the most commonly used quality assessment tools in the studies discussed above. However, evidence for links between scores on these instruments and overall site quality is mixed. In their assessments of depression sites, Griffiths and Christensen (2000) and Khazaal et al. (2008a) did not find significant associations between Silberberg scores and site quality. In a recent study, Khazaal et al. (2012) concluded that the DISCERN was a good indicator of website quality. However, the DISCERN is designed to be used by consumers without content expertise and therefore does not assess scientific quality or accuracy of evidence.

Several studies investigated the links between site owner characteristics and content quality. Eight studies found that higher quality information came from websites of government, professional, or charitable organizations (Lissman and Boehmlein, 2001; Ipser et al., 2007; Akram et al., 2008; Ferreira-Lay and Miller, 2008; Barnes et al., 2009; Morgan and Montagne, 2011; Reichow et al., 2012a; Grohol et al., 2014), whereas six others found that site ownership did not predict quality (Khazaal et al., 2008b, 2008c, 2008d, 2008e; Morel et al., 2008; Kilka et al., 2013). In general, characteristics associated with higher quality included government ownership, editorial boards, having information on a variety of mental health issues, having internal search engines, mentioning scientific evidence or citation of references, and an absence of financial interest. Sites by professional organizations tended to recommend one type of mental health care provider, thus limiting their quality scores to some extent. Khazaal et al. (2012) analyzed data from a number of studies and concluded that the HON label failed to predict website quality. Evidence of links between search engine page ranks and quality scores is mixed. Griffiths and Christensen (2005) assessed the links between evidence-based quality of content as measured by evidence-based depression guidelines and Google PageRank and concluded that these were correlated. Ipser et al. (2007) failed to find an association between Google PageRank and website quality, whereas Grohol et al. (2014) concluded that search engines’ algorithms largely returned relevant, good-quality mental health information.

A number of the studies listed the highest quality websites by topic area. Based on studies carried out since 2005, these websites are shown in Table 9.2. They can be used as a guide for consumers searching for high-quality information.
### Table 9.2 Top-Rated Currently Available Websites for Psychiatric Disorders

<table>
<thead>
<tr>
<th>General mental health information</th>
<th><a href="http://www.belpguide.org">www.belpguide.org</a></th>
</tr>
</thead>
<tbody>
<tr>
<td>Help Guide.org</td>
<td><a href="http://www.maryclinic.org">www.maryclinic.org</a></td>
</tr>
<tr>
<td>Mayo Clinic</td>
<td>nihm.nih.gov</td>
</tr>
<tr>
<td>National Institute of Mental Health</td>
<td><a href="http://www.psychcentral.com">www.psychcentral.com</a></td>
</tr>
<tr>
<td>Psych Central</td>
<td><a href="http://www.wikipedia.org">www.wikipedia.org</a></td>
</tr>
<tr>
<td>WebMD</td>
<td><a href="http://www.webmd.com">www.webmd.com</a></td>
</tr>
<tr>
<td>eMedicineHealth</td>
<td><a href="http://www.medicineHealth.com">www.medicineHealth.com</a></td>
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<td>MedicineNet</td>
<td><a href="http://www.medicineNet.com">www.medicineNet.com</a></td>
</tr>
<tr>
<td>WebMD</td>
<td>wikipedia.org</td>
</tr>
<tr>
<td>Readley et al., 2012</td>
<td>nihm.nih.gov</td>
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<tr>
<td>Wikipedia</td>
<td><a href="http://www.webmd.com">www.webmd.com</a></td>
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<tr>
<td>Depression</td>
<td>morganmontgomery.org</td>
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<td>Morgan and Montogom, 2011</td>
<td><a href="http://www.webmd.com">www.webmd.com</a></td>
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<tr>
<td>FamilyDoctor.org</td>
<td>familydoctor.org</td>
</tr>
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<td>Zemel et al., 2010</td>
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<td>Needitdoctor.co.uk</td>
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<td>The Royal College of Psychiatrists</td>
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<td>National Health Service (NHS)</td>
<td>nihm.nih.gov/health/publications/depression/complete-publication.shtml N2 10 71</td>
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<td>National Institutes of Mental Health (NIMH)</td>
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<td>Antidepressants</td>
<td><a href="http://www.sane.org.uk/About___Mental___Illness/Depression.htm">www.sane.org.uk/About___Mental___Illness/Depression.htm</a> N3 10 96</td>
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<td>Morgan and Montgomery, 2011</td>
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<td>nihm.nih.gov</td>
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<td>National Institutes of Mental Health (NIMH)</td>
<td><a href="http://www.bipolar.about.com">www.bipolar.about.com</a></td>
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### Table 9.2 Continued

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<th>Attention deficit hyperactivity disorder (ADHD)</th>
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<td>Akram et al., 2008 (UK)</td>
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<td>British Medical Journal</td>
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<td>Publishing Group Best Treatments</td>
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<td>NHS Direct Health</td>
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<td>Encyclopaedia ADHD</td>
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<td>Pharmaceutical company Products</td>
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<td>Suicide prevention</td>
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<td>Jans et al., 2010</td>
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<td>Suicide.org</td>
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<td>Postpartum mental health</td>
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<td>Sites for professionals (Moore and Ayers, 2011)</td>
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<td>Postpartum.net</td>
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<td>Sites for mothers with postpartum mental illness (Moore and Ayers, 2011)</td>
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<td>Reich et al., 2012</td>
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<td>Autism Treatment</td>
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<td>Johns Hopkins School of Public Health</td>
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**DO QUALITY INFORMATION WEBSITES CHANGE KNOWLEDGE, ATTITUDES, AND BEHAVIOR?**

Despite the considerable amount of mental health information on the Internet, relatively little is known about the links between information quality and health behaviors. It is largely unknown whether checklists such as DISCERN are useful to consumers and whether better quality information leads to better health outcomes.
Many of the studies discussed in this chapter use expert rating, and there is evidence that consumers are influenced by criteria that are different from those used by experts when evaluating information (Silence et al., 2007; Harris et al., 2009). Thus, design features appear to play a significant part in assessment and consumers have been shown to reject clinically credible sites because of poor design (Harris et al., 2009). It is likely that readability is also important to consumers and, because many of the studies reviewed here found reading levels (based on US years of schooling or grade levels) to be relatively high, it is likely that mental health websites need to put a greater emphasis on simplicity and intelligibility. Perceived expertise and absence of bias are also relevant; for example, a consumer may mistrust a pharmaceutical company website that an expert may rate highly against evidence-based criteria (Silence et al., 2007; Broom and Tevey, 2008). In a study of mental health-related Internet use, Lam-Po-Tang and McKay (2010) found that perceived reliability was not associated with perceived influence on health-related decision making.

Assessments of the effects of Internet information quality are further complicated by the fact that consumers typically use many sources of health information and effectiveness may take a long time to develop. Evidence suggests that many of those who obtain information on the Internet discuss this with their health practitioners (Silence et al., 2007; Lam-Po-Tang and McKay, 2010).

A growing number of studies have attempted to assess the impact of web-based psychoeducation interventions on knowledge and beliefs about psychiatric disorders and treatments. Web-based psychoeducation interventions typically cover information on signs and symptoms of mental illness, treatments, self-help behavior, and where to seek help. They may also incorporate skills training designed to reduce symptoms and promote healthy behaviors. There is evidence that web-based psychoeducation interventions can improve mental health literacy, which has been defined as “knowledge and beliefs about mental disorders which aid their recognition, management, or prevention” (Jorm et al., 1997); a relatively small number of studies have shown impact on user behavior. However, longer term effects are unknown. A key issue to consider when assessing the impact of web-based interventions is whether these are supported by a clinician or appropriately trained nonprofessional or whether they are entirely automated; there is evidence that the addition of support leads to better outcomes (Richards and Richardson, 2012).

**Depression and Anxiety Disorders**

In one of the first randomized controlled trials to test the efficacy of web-based depression treatment, Christensen et al. (2004) assessed the impact of the mental health information website BluePages (www.bluepages.anu.edu.au) and the cognitive-behavioral therapy (CBT) skills training website MoodGYM (www.moodgym.anu.edu.au). Both users of BluePages and MoodGYM were contacted weekly by lay people to direct their use of the websites, including which sections to visit. They found that both sites improved knowledge of evidence-based treatments, including CBT. The effectiveness of MoodGYM in improving mental health literacy has been assessed in other studies, including a randomized controlled trial involving Norwegian university students with elevated psychological distress (Lindqvist et al., 2013). MoodGYM was effective in increasing depression literacy at the 2-month follow-up. However, no benefits were seen in studies involving teenage males (O’Kearney et al., 2006) and teenage females (O’Kearney et al., 2009).

In a more recent study, 155 callers to Lifeline (a telephone counseling service) who met the criteria for moderate to high psychological distress were randomly assigned to one of four conditions: (1) web CBT (MoodGYM and BluePages) plus weekly telephone tracking; (2) web CBT only; (3) weekly telephone tracking only, and (4) neither website nor telephone tracking (Farrer et al., 2012). Participants were assessed at preintervention, postintervention, and 6 and 12 months postintervention. Results showed that those in the web-only and web-plus-tracking conditions had significantly higher depression literacy at postintervention, and this was maintained in the Web-only condition at the 6-month follow-up point. No significant differences were found in depression literacy among all four conditions at 12 months.

In the context of the low rates of help seeking for mental health problems, an aim of some websites is to promote evidence-based treatments, many of which involve seeking professional help. In an attempt to assess the impact of web-based interventions on help seeking, 414 people with elevated scores on a depression assessment scale were randomly allocated to BluePages, MoodGYM, or an attention control condition (Christensen et al., 2006). Interviewers maintained weekly telephone contact with participants in all conditions over the period of the intervention (a total of six contacts of approximately 10 minutes each). Use of BluePages was associated with behavioral changes such as decreases in seeking support from friends and family and using everyday therapeutic measures (spending time with family and friends, exercising, eating chocolate, listening to music, being with pets, and doing more enjoyable things) but no increase in seeking evidence-based interventions. MoodGYM was associated with reports of help seeking for CBT, massage, and exercise. A follow-up study found these changes to be maintained over 12 months (Mackinnon et al., 2008).

A number of studies suggest that unsupported website use can have beneficial effects on mental health literacy. These include a web-based intervention (MIDOnline: www.midonline.com.au), which has also been shown to improve mental health literacy relating to depression in Greek- and Italian-born immigrants (Kirooulos et al., 2011). Deltz et al. (2009) assessed the effects of a web-based program (http://symbonite.com/loginpage.asp) providing working parents with the knowledge and skills necessary for prevention and early intervention of mental health problems in young people. Those in the intervention group showed significantly greater knowledge about anxiety, depression, and treatment options.

**Eating Disorders**

StudentBodies is a program that targets women at risk for eating disorders by helping them improve their dietary practices, attitudes to the body, and body image
Mental Health First Aid and Caregiving Behaviors

Hart et al. (2012) conducted a study in which web users who downloaded mental health first aid guidelines from a website were invited to respond to an initial questionnaire and then, one month later, a follow-up questionnaire assessing their views on the usefulness of the documents and whether they had influenced behavior. Results showed that of 154 people who responded to the second questionnaire, 63 had provided first aid and 23 had sought care themselves. In another study, Berk et al. (2013) used the Delphi consensus method to develop a set of guidelines for caregivers of adults with bipolar disorder and then conducted an evaluation of the acceptability and usefulness of the online version of these guidelines. These authors found that at least 80% of users found the various sections of the website useful. Moreover, two-thirds of the caregivers reported using the information 1 month later.

Help Seeking for Mental Health Problems

Santor et al. (2007) examined the use and impact of a school-based health information website on high school students. Their results showed that female students, students wanting professional help, those scoring higher on depressive vulnerability measures, and students reporting more severe mood problems logged on frequently over longer periods of time, viewed information sheets, posted and viewed questions and answers, and completed the symptom screen. Visits to the website were positively associated with visits to school health centers and guidance counselors and referrals to a health professional.

Mental Health Game Websites

The popularity of computer games has led to the development of game websites that aim to improve mental health literacy. These are often targeted toward young people. Reach Out Central (http://roc.reachout.com.au/flash/index.html), an online gaming program designed to support the mental health of people aged 16 to 25 years, has been evaluated using a pre-post study design involving 266 young people (Shandelmy et al., 2010). Improvements in mental health literacy were seen postintervention. Li et al. (2013) evaluated the effectiveness of a fully automated, web-based, social network electronic game designed according to cognitive-behavioral approaches (https://apps.facebook.com/mentalhealthgame/)

in enhancing mental health knowledge. A pre/post-test design was used, with 73 undergraduates self-assessing their mental health literacy before and after completing the game within a 3-week period. The study showed that the gaming approach was effective in enhancing young people's mental health literacy.

Summary

Research studies suggest that quality information websites can change knowledge, attitudes, and behavior to some extent, particularly for depression, which is one of the most frequently studied mental health problems. Studies have also shown that websites may be effective in changing disorder-related attitudes and behaviors, helping people identify mental health problems in school-age children, and mental health first aid behaviors. However, most studies have only assessed short-term effects and the longer term impact is unknown.

FUTURE RESEARCH DIRECTIONS

Although the speed of technology and program development means that there will be technologies and devices available in the future that we have difficulty predicting, it is likely that the area of electronic mental health as a whole will grow in importance. The recent move toward mobile phone-based interventions may have implications for web-based interventions, which may become adapted to particular functions (Jorg et al., 2013). Tailoring to an individual's needs is likely to increase the effectiveness of web-based interventions; this may be enhanced by further research on identifying consumers of mental health information on the Internet and on effects of this information on mental health behaviors such as help-seeking and use of evidence-based treatments. The move toward greater interactivity, information sharing, and collaboration on the Internet (Web 2.0) may offer such opportunities.

There is also a need for greater evaluation of web-based psychoeducation interventions, because much of what is currently available has not been evaluated. One of the main goals of health education is behavioral change; therefore, it can be argued that the extent to which a web-based intervention applies recognized behavior change theories is an indicator of quality. Mental health website quality assessment can be extended to cover the extent to which sites meet the evaluation criteria arising out of such a framework and may include naturalistic reports of user behavior (Silicence et al., 2007; Frost et al., 2008). This may involve the development of innovative ways of assessing health-related behaviors and outcomes, which new technologies can support and enable.

CONCLUSION

In conclusion, the evidence suggests that the quality of mental disorder information on the Internet is variable and can depend on the topic in question, with
information on bipolar disorder and depression generally being of higher quality. Information quality appears to be improving over time, particularly for more frequently assessed topics such as depression. However, despite the concerns about the quality of health information on the Internet, there is no clear agreement on the best way to improve this; the methods that have been tried, including labeling and codes of conduct, have shown mixed results.

A number of studies have assessed the characteristics of higher quality sites. These studies suggest that, in general, consumers wishing to find better quality sites should look for those that are government owned, have editorial boards, have information on a variety of mental health issues, have internal search engines, mention scientific evidence or citation of references, and have an absence of financial interest.

There is some evidence that quality information websites can change knowledge, attitudes, and behavior to some extent, particularly for depression. Studies have also shown benefits in eating disorder–related attitudes and behaviors, helping people with mental health problems in school-age children, and mental health first aid and caregiving behaviors. However, there is a need for greater evaluation of web-based psychoeducation interventions, because much of what is currently available has not been formally assessed, particularly over the longer term. Given the rapid pace of technological change, such evaluation is likely to involve new technologies and those that are yet to be invented.

DISCLOSURE STATEMENT

The authors disclose no relationships with commercial entities and professional activities that may bias their views.

REFERENCES


