Chapter 1

General introduction
Why this PhD thesis?

Mental care online, or e-mental health, is an emerging field of treatment and research. Considering over 2.3 billion people use the internet ("Internet World Stats.," 2012), it is both a challenge and an opportunity to provide accessible and directly available help to those with mental health problems.

E-mental health can be defined as follows: “E-mental health can be understood as a generic term to describe the use of information and communication technology – in particular the many technologies related to the internet – when these technologies are used to support and improve mental health conditions and mental health care, including care for people with substance use and comorbid disorders” (Riper, et al., 2010). Within this field, technology is used for screening, prevention, early intervention and treatment, among other topics. Studies on these topics have been shifting through the years from feasibility and efficacy trials to more detailed and elaborate questions, such as the role of support, treatment adherence, mechanisms of change, mobile technologies, and implementation (Christensen, Calear, Andersson, Thorndike, & Tait, 2012).

Depression and anxiety disorders belong to most prevalent common mental disorders (De Graaf, Ten Have & Dorsselaer, 2010). Numerous studies have proved the efficacy of internet-based interventions for these disorders (Andrews, Cuijpers, Craske, McEvoy, & Titov, 2010). Because internet-based treatment has been shown to be efficacious, doors are opened for further research. Other outcome measures, such as treatment adherence, could point out the acceptability of internet interventions to participants. Furthermore, little research has focused on interventions for mild symptom severity, while internet interventions may be especially suited to treat mild disorders (Sunderland, Wong, Hilvert-Bruce, & Andrews, 2012). Such an early intervention could possibly be a preventive intervention, i.e. preventing the symptoms from developing into a more severe disorder.

Topics related to internet interventions can be further examined as well. One of those topics is internet-based testing or screening. These instruments can direct individuals to internet interventions or test them for suitability for participation. However, little development has been made to create instruments that incorporate media other than text. The use of media like sound and images could expand the applicability of screening instruments to those who have difficulty reading. Another topic that has had little attention so far is suicide prevention online. Few internet-based interventions target suicidal ideation and behaviour and more acute help than an internet-based intervention may be in order.
This thesis addresses a set of emerging questions that surround these new developments. It will focus specifically on internet-based early intervention for depression and anxiety disorders, and the related topics of suicide prevention and screening. The following research questions are studied:

**Screening:**
- Can online screening for depression and anxiety be innovated by making use of multimedia techniques other than text?
- What is the validity of such a multimedia online screening instrument for agoraphobia?
- How do the results of internet-based screening for suicidal ideation relate to the results of a diagnostic interview by telephone?

**Suicide prevention:**
- How many adults with anxiety and depression who search the internet for help suffer from suicidal ideation?
- What is the quality of suicide information on the internet?

**Early intervention and treatment:**
- Is an internet-based intervention for panic and agoraphobic symptoms effective in a sample of participants with mild symptom severity?
- What is the treatment adherence to internet-based treatment for depression?
- Is the treatment adherence to internet-based treatment for depression comparable with adherence to face-to-face treatment for depression?

**Depression and anxiety disorders**

**Definitions**
The mental disorders investigated in this thesis are usually referred to as common mental disorders. The definition of common mental disorders can vary slightly across the literature, but usually includes depression and anxiety disorders (National Collaborating Centre for Mental Health, 2011; Krueger, 1999). This thesis focuses on adults (18+) who suffer from the following disorders according to the DSM-IV-TR (American Psychiatric Association, 2000): major depressive disorder, generalised anxiety disorder, panic disorder with or without agoraphobia, agoraphobia without panic, specific phobia, social phobia, obsessive-compulsive disorder and post-traumatic stress disorder. Suicidal ideation, defined as thoughts
about ending one's life, is a symptom of major depressive disorder in the DSM-IV-TR. However, it is also associated with anxiety disorders, as will be described below.

Besides the full-blown common mental disorders according to the DSM-IV-TR, this thesis also focuses on subclinical disorders. A subclinical disorder can be defined as clinically relevant symptoms that do not meet all criteria of a specific disorder according to the DSM-IV-TR. While full-blown, i.e. clinical, disorders can be diagnosed by means of a diagnostic interview, subclinical disorders are usually measured by means of self-report instruments with continuous scales.

**Prevalences**

Every year, 10.1% of the adult population suffers from an anxiety disorder and 5.2% suffers from depression (De Graaf, et al., 2010). Depression and anxiety disorders are associated with functional disability, which is similar or even greater than functional disability associated with physical disorders, like arthritis and heart disease (Buist-Bouwman, et al., 2006; Merikangas, et al., 2007). The direct and indirect costs of depression and other mood disorders can be estimated at about 5000 Euro per patient per year in 2003 in the Netherlands (Smit, et al., 2006). This figure was about 3600 for anxiety disorders (Smit, et al., 2006). Symptoms of anxiety and depression often coincide. All combinations of major depressive disorder and anxiety disorders are probable and, except for obsessive-compulsive disorder, each disorder increases the risk of having one of the other disorders (Kessler, Chiu, Demler, Merikangas, & Walters, 2005).

The prevalence of subclinical disorders is equal to or can exceed the prevalence full-blown disorders (Merikangas, et al., 2003). Not only can subclinical disorders be a burden for both the patient and society (Batelaan, De Graaf, Van Balkom, Vollebergh, & Beekman, 2007; Batelaan, Smit, et al., 2007), they can also act as precursors for the development of full-blown disorders (Shankman, et al., 2009). While subclinical symptoms of depression are mostly a precursor for the development of full-blown depression (Shankman, et al., 2009), subclinical anxiety symptoms can predict the onset of full-blown anxiety disorders, full-blown depression and other mental disorders (Kinley, Walker, Enns, & Sareen, 2011; Merikangas, et al., 2003; Shankman, et al., 2009).

Depression and anxiety can lead to suicidal ideation, especially when depression coincides with one or more anxiety disorders (Norton, Temple, & Pettit, 2008; Sareen, et al., 2005). Suicide attempts are associated with the combination of depression and acute severe attacks of anxiety or stress (Nock, Hwang, Sampson, & Kessler, 2010). Every year, approximately one million people die of suicide
worldwide (World Health Organisation, 2012). The number of people who attempt suicide is far higher. A Dutch population study estimated that, every year, about 1% of the total population attempt suicide (Ten Have, et al., 2007), while 6% have thoughts about suicide or a desire to die (Ten Have, et al., 2007).

Treatment and early intervention
Depression and anxiety disorders can improve with suitable treatment. Drug therapy is indicated for severe cases of depression and anxiety disorders (National Institute for Health and Clinical Excellence, 2011). Mild to moderate cases can be treated with psychotherapy (National Institute for Health and Clinical Excellence, 2011). Group therapy can be an early intervention for subclinical cases (Meulenbeek, et al., 2010). Individual psychotherapy, group therapy and guided self-help have proved effective in the treatment for depression and anxiety (Cuijpers, Andersson, Donker & Van Straten, 2011). Cognitive-behavioural therapy (CBT) is the most extensively studied form of psychotherapy and has proved to be efficacious (Cuijpers, et al., 2011). Therapies with other theoretical bases, like problem-solving therapy or interpersonal psychotherapy, are similar to CBT in effect (Cuijpers, et al., 2011). Although the effect of psychotherapy may be overestimated due to publication bias (Cuijpers, et al., 2011), it is clear that a person with depression or anxiety has several options of evidence-based treatment. However, in practice, adults with common mental disorders do not always receive evidence-based treatment (Andrews, Issakidis, Sanderson, Corry, & Lapsley, 2004; Craske & Zucker, 2001). Moreover, not all adults with common mental disorders seek help.

Help seeking
The proportion of individuals with depression or anxiety who seek help for their mental problems varies in the literature (De Graaf, et al., 2010; Roness, Mykletun, & Dahl, 2005; Young, Klap, Sherbourne, & Wells, 2001). In the Netherlands, 58.7% of adults with mood disorders and 34.8% of those with anxiety disorders received some form of care in the last year (De Graaf, et al., 2010). Most of these had received primary care, while 37.4% of those with mood disorders and 22.2% of those with anxiety disorders had received ambulatory or residential mental health care. Depression is characterised by passiveness and low self-esteem, which may be a cause of difficulty when seeking help. A person with an anxiety disorder could be too fearful to contact a health care professional. In addition, help-seeking could be further compromised by fear of stigmatisation or little awareness of effective treatment opportunities or available services. Such obstacles to accessing
Information through traditional sources are reasons for people search the internet for help (Powell, Inglis, Ronnie, & Large, 2011). Evidence suggests that many adults and adolescents with common mental disorders search the internet for help and information (Andreasonsen, et al., 2007; Batten & Dutton, 2011; Powell, et al., 2011; Spek, et al., 2007; Titov, Andrews, Kemp, & Robinson, 2010).

**Internet-based screening, prevention and early intervention**

*Internet usage and help-seeking online*

At the start of 2012, there were 2.3 billion internet users worldwide ("Internet World Stats.," 2012). The characteristics of individuals who search for help online have been examined in a few studies. In terms of demographic characteristics and presenting problems, the patients of online clinics are comparable with the patients that are generally seen in mental health care (Ruwaard, Lange, Schrieken, Dolan, & Emmelkamp, 2012; Titov, Andrews, Kemp, et al., 2010). Contrary to what is often assumed, individuals who search for help online can have severe mental disorders, and are not necessarily young or technologically sophisticated (Titov, Andrews, Kemp, et al., 2010).

*Online screening*

Online screening or testing is a central element of internet-based treatment. In general, online screening instruments for depression and anxiety can indicate the type of disorder and the severity of the symptoms. Based on the results, a help-seeker could be referred to suitable help. Screening instruments can also have an educational value, because individuals with common mental disorders may not recognise their disorder. For example, chest pain caused by anxiety could be misinterpreted for a physical problem and patients could present to the emergency department (Lessard, et al., 2012). Internet-based screening instruments can be applied by clinicians and researchers as well. The screening results of applicants for research or treatment can indicate their suitability for participation. For example, some treatments are less suited to participants with very low or very high symptom severity, or to participants with severe comorbid symptoms.

Online screening instruments usually consist of multiple items, which can yield a score on a continuous scale. Continuous scales give an indication of symptom severity and cut-off points on the scale can indicate a subclinical disorder and a full-blown disorder. Shorter instruments that only detect the presence or absence of a disorder are used as well (Donker, Van Straten, Marks, & Cuijpers, 2010).
An important criterion for the applicability of screening instruments is their validity. Several internet-based measures for anxiety and depression have proved valid (Cuijpers, Boluijt, & Van Straten, 2008; Donker, et al., 2011) and efficient (Austin, Carlbring, Richards, & Andersson, 2006). For depression and anxiety disorders, internet-based screening instruments are usually established pencil-and-paper measures that have been put online, but a pencil-and-paper screening instrument’s psychometric properties may be different when it is placed on the web (Cuijpers, et al., 2008; Donker, et al., 2011). Therefore, several studies have validated pencil-and-paper questionnaires for use on the internet, e.g. for panic symptoms (Carlbring, et al., 2007), social phobia (Hedman, et al., 2010) and generalised anxiety (Donker, et al., 2011). Among other factors, the difference in validity could be explained by the anonymity of internet-based testing. Participants may feel more free to be honest in answering questions.

Innovations in online screening include adaptive testing and the use of other media than text. Adaptive testing means tailoring the instrument to previous answers the participant has given. For example, if a person scores positive on an item that screens for a particular disorder, additional items can be provided to assess the symptom severity of that disorder (e.g. Lin, et al., 2007). Another innovation is to incorporate images, animations, video and sound in screening instruments. While an instrument may become more attractive when using media other than text, such an instrument could also be more intelligible to those who have difficulty reading.

**Online suicide prevention**

An online help-seeker with depression and/or anxiety should be able to find accessible, evidence-based information about his or her mental problems, including referrals to treatment. An essential part of this information is what to do in a suicidal crisis, because it is important to provide direct help to a person who considers to end his or her life. Moreover, someone who seeks suicide-related help and information online is unlikely to seek face-to-face help (Harris, McLean, & Sheffield, 2009). Therefore, the internet may be a valuable medium for suicide prevention.

The internet can be beneficial, but also dangerous for a person who has thoughts about suicide (Durkee, Hadlaczyk, Westerlund, & Carl, 2011). Suicidal individuals visit both suicide prevention websites and pro-suicide websites and are often looking for anonymous peer contact on message boards (Harris, et al., 2009). The reason for this search for anonymous peer support may not be to ask for help
directly, but rather to be recognised as being authentically suicidal (Horne & Wiggins, 2009). However, evidence suggests that message boards or forums for suicidal individuals are probably most of the time used in a constructive rather than a destructive way (Baker & Fortune, 2008; Eichenberg, 2008; Harris, et al., 2009).

High quality, accessible websites for suicide prevention are needed from a public health point of view. Even though non-profit organisational and government websites provide more evidence based information about suicide than personal and media websites (Szumilas & Kutcher, 2009), the majority of statements on suicide prevention websites is not evidence based (Szumilas & Kutcher, 2009). Further research is required into the quality of suicide prevention websites, to find the shortcomings and make suggestions for future developments.

**Online treatment and early intervention**

It has been well established in a growing number of randomised controlled trials that depression and anxiety disorders can be treated online with internet-based interventions (Andersson & Cuijpers, 2009; Andrews, et al., 2010). Interventions using mobile phones are an emerging development as well (Burns, et al., 2011). Internet-based interventions can be roughly divided in guided and unguided interventions. Unguided interventions are fully automated self-help programmes without any therapist support (e.g. Christensen, Griffiths, Mackinnon, & Brittiffe, 2006; Clarke, et al., 2005; Meyer, et al., 2009). Guidance in guided self-help interventions is usually conducted by email by a therapist or coach (e.g. Berger, Hohl, & Caspar, 2009; Carlbring, et al., 2006; Titov, Andrews, Davies, et al., 2010). Guided web-based interventions are more efficacious in reducing depressive and anxiety symptoms than unguided ones (Spek, et al., 2007).

Most web-based interventions for depression and anxiety consist of internet-delivered cognitive behavioural therapy (iCBT). A meta-analysis studied the effects of computer-delivered (of which most internet-delivered) interventions consisting of CBT for depression and three anxiety disorders (Andrews, et al., 2010). This study showed that computerised CBT is efficacious for depression (Hedge's $g = 0.78; n = 6$), social phobia ($g = 0.92; n = 8$), panic disorder ($g = 0.83; n = 6$) and generalised anxiety disorder ($g = 1.12; n = 2$) (Andrews, et al., 2010). While research into internet-delivered self-help programmes shows that these are efficacious treatments for depression and anxiety, and that these could be acceptable for both patients and professionals (Gun, Titov, & Andrews, 2011; Kaltenthaler, et al., 2008), there are still a number of issues that need to be addressed.

As mentioned above, subclinical depressive and anxiety symptoms are
prevalent and can develop into full-blown disorders. An accessible internet-based self-help course can serve as early intervention for subclinical cases, and may even prevent the onset of a full blown disorder. Evidence suggests that internet-based treatment is most suited to adults with mild levels of symptom severity (Sunderland, et al., 2012). However, most studies on the effect of internet-based treatment for depression and anxiety include only participants with a full-blown disorder (Andrews, et al., 2010). A second issue is that of adherence. Internet-based interventions can be associated with a substantial proportion of participants who do not complete their treatment (Christensen, Griffiths, & Farrer, 2009). While adherence to internet interventions could be related to treatment outcome (Donkin, et al., 2011), it can also indicate whether the treatment is acceptable to the participant. Therefore, while the efficacy of internet-based treatment for anxiety and depression is known, further research is needed on early intervention and treatment adherence.

Outline

In Chapter 2, a new screening instrument for common mental disorders is described. This instrument, the Visual Screener for Common Mental Disorders (VS-CMD), consists of 12 items (typically 1 for every disorder) and each screening item is a combination of images, animations, sound and a little text. The item that measures agoraphobia is validated against a diagnostic interview by telephone and compared with the validity of text-based items. Chapter 3 examines the prevalence of suicidal ideation, measured by an online screening instrument, in a sample of online help-seekers with common mental disorders. The associations between the common mental disorders and suicidal ideation are explored, as well as the prevalence of suicidal ideation if measured by the online screener or measured by a diagnostic interview by telephone. Chapter 4 gives an overview of Dutch suicide-related information on the internet and describes the quality of the websites for suicide prevention. Chapters 5 and 6 concern a randomised controlled trial of the effectiveness of an internet-based intervention for panic and agoraphobic symptoms. The protocol for this randomised controlled trial is described in Chapter 5. Chapter 6 reports the results of this trial in terms of adherence and effectiveness on anxiety and depressive symptom severity. The investigated intervention is aimed at both subclinical and full-blown panic disorder and the recruited sample contains participants with panic symptoms and various comorbid common mental disorders. In Chapter 7, the adherence to guided internet-based cognitive behavioural therapy
for depression is investigated in a meta-analysis. Besides the proportion of treatment completers versus non-completers, a continuous measure of adherence is analysed as well. The adherence rates of guided internet-based cognitive behavioural therapy are compared with the adherence rates of individual face-to-face cognitive behavioural therapy. Finally, Chapter 8 discusses the main findings, limitations and implications of these studies.

References


Chapter 2

Single-item screening for agoraphobic symptoms: validation of an internet-based audiovisual screening instrument

Published as:
Abstract

The advent of internet-based treatments for anxiety disorders creates a need for quick and valid online screening instruments, suitable for a range of social groups. This study validates a single-item multimedia screening instrument for agoraphobia, part of the Visual Screener for Common Mental Disorders (VS-CMD), and compares it with the text-based agoraphobia items of the PDSS-SR. The study concerned 85 subjects in an RCT of the effects of internet-based therapy for panic symptoms. The VS-CMD item and items 4 and 5 of the PDSS-SR were validated by comparing scores to the outcomes of the CIDI diagnostic interview. Screening for agoraphobia was found moderately valid for both the multimedia item (sensitivity .81, specificity .66, AUC .734) and the text-based items (AUC .607 – .697). Single-item multimedia screening for anxiety disorders should be further developed and tested in the general population and in patient, illiterate and immigrant samples.
Introduction

Anxiety disorders are the most prevalent type of mental disorders, affecting about 17% of all people at least once in their lifetime (Somers, Goldner, Waraich, & Hsu, 2006). They can improve with suitable psychological and/or drug therapy (National Institute for Health and Clinical Excellence, 2004; Furukawa, Watanabe, & Churchill, 2006), but only one in four people with anxiety symptoms seek help (Roness, Mykletun, & Dahl, 2005).

A more accessible alternative to face-to-face therapy could be internet-based interventions. These have proved as effective as face-to-face help for anxiety disorders (Cuijpers, et al., 2009) and they have several advantages. First, users can receive the treatment in the comfort of their homes and do not have to travel to a therapist or mental health centre. Second, even guided internet-based interventions - which have been found more effective than unguided ones (Spek, et al., 2007) - can take less therapist time than face-to-face help (Carlbring, et al., 2005). Third, the information can be presented in an attractive manner with audio, images and animations (Sorbi & Riper, 2009). Fourth, outcomes of screening and progress monitoring can be instantly available to a health care provider, as well as to the users themselves if the programme is interactive or the screening leads to advice or redirection.

Both in research and in clinical practice, internet-based therapy requires internet-based measures to direct help-seekers to appropriate information, screen them for suitability for therapy, and monitor progress. Evidence suggests that internet-based measures can be valid (Buchanan, 2002) as well as time-efficient and economically efficient (Austin, Carlbring, Richards, & Andersson, 2006), for example for assessing symptoms related to panic disorder (PD)(Austin, et al., 2006).

For depression and anxiety disorders, internet-based screening questionnaires are usually digital versions of pencil-and-paper measures, even though psychometric properties may be different when a screener is placed on the internet (Cuijpers, Boluijt, & Van Straten, 2008; Donker, Van Straten, Marks, & Cuijpers, 2011; Whitehead, 2011). Some studies revalidate existing questionnaires for online use, e.g. for panic symptoms (Carlbring, et al., 2007), social phobia (Hedman, et al., 2010) and generalised anxiety (Donker, et al., 2011). The field of internet intervention research is innovating rapidly (Riper, et al., 2010) and developing internet-based psychometric measures. Examples of internet-based questionnaires for common mental disorders are the Internet-Based Self-Assessment Program for Depression (ISP-D)(Lin, et al., 2007), the Web-Based...
Depression and Anxiety Test (WB-DAT) (Farvolden, McBride, Bagby, & Ravitz, 2003) and the Web Screening Questionnaire (WSQ) (Donker, Van Straten, Marks, & Cuijpers, 2009). These questionnaires have moderate to good screening properties (sensitivity .63 to 1.00, specificity .44 to .97).

An additional advantage of the WSQ and the ISP-D is the use of single screening items. A single short item can quickly direct a user either to more elaborate items measuring symptom severity or to psycho-education (Donker, et al., 2009; Lin, et al., 2007). Single-item screening is a quick means to screen for mood and anxiety disorders and has been proved to be valid (Choichinov, Wilson, Enns, & Lander, 1997; Donker, et al., 2009, 2011; Lin, et al., 2007), while taking less time than multi-item instruments. Some studies have shown single-item instruments are just as accurate as multi-item instruments (Choichinov, et al., 1997; Donker, et al., 2009), but, in general, it can be assumed that when an instrument gathers more data, its validity increases.

Existing internet-based instruments may differ from pencil-and-paper questionnaires by using answers to instantly adapt the measure or the presentation of only one item per screen (Thorndike, et al., 2009), but they are still text-based. The use of multimedia could aid the understanding of items, particularly by users who have difficulty reading. Studies have shown that the use of multimedia for educational purposes can result in better comprehension of the material presented, especially when images or animations are combined with text or narration (Houts, Doak, Doak, & Loscalzo, 2006; Mayer, 2005).

A questionnaire that employs visual and auditory elements could be more appealing in general and also better suit people with lower reading levels. This motivated the development of the Visual Screener for Common Mental Disorders (VS-CMD) (Riper, et al., 2009). The VS-CMD is a 12-item questionnaire that screens for symptoms of anxiety disorders, depression, alcohol abuse and suicidal ideation. Its items consist of simple text, voice narration and images or animations.

The current study validates a single item of the VS-CMD which screens for agoraphobic symptoms. The data derive from a randomised controlled trial (RCT) of internet-based self-help for subclinical to mild panic disorder (PD) in adults in the general population (Chapters 5 and 6). Randomisation of participants in the RCT is stratified for agoraphobic symptoms, because that condition can complicate certain elements of the self-help course, such as exposure exercises. That stratification is based on an item of the Panic Disorder Severity Scale – Self Report (PDSS-SR) (Houck, Spiegel, Shear, & Rucci, 2002), a validated, text-based questionnaire. Because a diagnostic interview is used, predictive validity can be established for both the PDSS-SR agoraphobia item and the VS-CMD agoraphobia.
The aim of this study is twofold. First, we assess the validity of internet-based single-item screening for agoraphobic symptoms. Second, we compare the multimedia agoraphobia item of the VS-CMD to the text-based agoraphobia items of the PDSS-SR, checking whether stratification for the RCT based on the agoraphobia item of the VS-CMD would be as valid.

Figure 1. Item 5 of the VS-CMD.

Method

1. Ethics statement
The RCT protocol was approved by the Medical Ethics Review Committee of the VU University Medical Centre (METc VUmc) in Amsterdam. Written informed consent was obtained from all participants.

2. Participants
Participants were recruited among the general Dutch population by means of articles on a news website, a Facebook advertisement campaign, messages on panic- or anxiety-related online forums, banners on health-related websites and
advertisements in newspapers. They were invited to enter a randomised controlled trial (RCT) comparing an internet-based course for panic symptoms to a waiting-list control group. For more detailed information on the RCT, see Chapters 5 and 6. Applicants could apply by printing and signing the informed consent form, which could then be scanned and emailed or returned by post. Participation required only an email address and a phone number. Multiple entries by a single participant were unlikely as every participant was interviewed by phone. Data were collected from March-December 2010.

The study population consisted of adults with subclinical or mild panic disorder (PD). Inclusion criteria were: aged at least 18, internet access, and subclinical or mild PD (PDSS-SR scores of 5-15). Individuals with too mild (PDSS-SR scores of 1-4) or too severe panic symptoms (scores of 16 or higher) were thereby excluded, as were people reporting moderate to high suicide risk. Those with severe panic or suicide risk were emailed advice to contact their general practitioner. The RCT was registered in the Netherlands Trial Register, part of the Dutch Cochrane Centre (NTR1639).

3. Instruments

The Visual Screener for Common Mental Disorders (VS-CMD)

The VS-CMD is based on the Web Screening Questionnaire (WSQ)(Donker, et al., 2009). The WSQ is a 15-item text-based screening instrument for common mental disorders. It has proved a valid screener for social phobia, PD with agoraphobia, agoraphobia (without PD), obsessive-compulsive disorder and alcohol abuse/dependence (sensitivity .72 – 1.00; specificity .63 – .80)(Donker, et al., 2009). Its psychometric properties were slightly more modest for major depressive disorder, generalised anxiety disorder, posttraumatic stress disorder, specific phobia and PD without agoraphobia (sensitivity: .80 – .93; specificity: .44 – .51). Note that these data reflect the validity of the WSQ compared to full-blown diagnoses ascertained by the CIDI by telephone (Donker, et al., 2009).

The VS-CMD consists of 12 items and intends to measure clinically relevant symptoms of major depressive disorder, generalised anxiety disorder, PD, agoraphobia, specific phobia, social phobia, post-traumatic stress disorder, obsessive-compulsive disorder, alcohol abuse and suicidal ideation. Depression and suicidal ideas are each detected by two items, while other topics are detected by single items. Each item appears on a separate screen, which has been shown to be preferred by patients while being just as valid as multiple items per screen (Thorndike, et al., 2009). The items consist of illustrations or animations supported
by a single, simply written sentence, which is also provided in spoken form. Currently, the VS-CMD is available in Dutch, English, Moroccan Arabic, Spanish and Turkish. There are male and female versions, each with corresponding images and voice-overs. The translations and voice-overs were performed by native speakers. The name “Visual Screener” has been chosen by the developers to emphasise the visual/graphic functionalities of this instrument.

The VS-CMD was compared with the WSQ among Dutch university students of ethnic Dutch and ethnic Turkish backgrounds. In the Dutch sample, the agoraphobia item did not show a significant association with its WSQ counterpart, but it did in the Turkish sample. The agoraphobia item in the Dutch VS-CMD (item 5) was therefore rephrased, without changing the graphics (Riper, et al., 2009).

Item 5 was developed to screen for clinically relevant agoraphobic symptoms, i.e. symptoms that may not meet criteria of a full-blown disorder according to the DSM-IV-TR, but are a disability for the patient and do warrant treatment. According to the DSM-IV-TR, agoraphobia means anxiety and avoidance related to places or situations from which escape might be difficult (or embarrassing) or in which help may not be available in the event of having an unexpected or situationally predisposed panic attack or panic-like symptoms (American Psychiatric Association, 2000). The DSM-IV-TR classifies agoraphobia as subordinate to PD. It can either be diagnosed as PD with agoraphobia, or as agoraphobia without history of PD. The current paper focuses on full-blown agoraphobia that accompanies panic symptoms, first, because all of the participants suffer from subclinical to full-blown PD and second, because the gold standard (the CIDI) only makes a distinction between no diagnose and full-blown diagnose. The VS-CMD item visually depicts 4 situations that could frighten people with agoraphobic symptoms, supported by the question: ‘Are you afraid of crowded places where it is difficult to leave quickly?’ (Figure 1). The VS-CMD yields a dichotomous prediction for agoraphobic symptoms (the user answers ‘yes’ or ‘no’).

Participants in the present study completed all 12 items of the VS-CMD. A built-in clock registered how much time each participant spent on completing the instrument.

**Panic Disorder Severity Scale-Self Report (PDSS-SR)**

The full PDSS-SR consists of 7 items and is a valid instrument to screen for PD with adequate psychometric properties when compared to the interview form of the Panic Disorder Severity Scale (Houck, et al., 2002; Wuyek, Antony, & McCabe, 2011). Each item consists of an introduction to a specific symptom and 5 answer options scoring 0 to 4. Item 4 (PDSS-SR-4) assesses agoraphobic avoidance and
item 5 (PDSS-SR-5) interoceptive avoidance, which means avoidance of situations that could induce physiological responses similar to those occurring in an anxiety crisis. PDSS-SR-5 was included in the present study, because agoraphobic behaviour associates with interoceptive avoidance. In the RCT, the stratification of the randomisation was based on the PDSS-SR-4 score alone, scores of 2 or higher denoting agoraphobic symptoms. PDSS-SR-4 correlates with measures of agoraphobic avoidance and cognitions (Furukawa, et al., 2009). The cut-off point of 2 is consistent with that in other studies (Furukawa, et al., 2009; Meulenbeek, et al., 2008). The present study used the Dutch version of the PDSS-SR (De Jager, Lange, & Emmelkamp, 2003).

*Composite International Diagnostic Interview (CIDI)*
Diagnosis of agoraphobia was obtained using the 12-month version of the CIDI (World Health Organisation, 1997; Ter Smitten, Smeets, & Van den Brink, 1998). The CIDI is an extensive, fully structured and valid diagnostic interview to assess ICD-10 and DSM-IV Axis-I diagnoses (Robins, et al., 1988; Wittchen, 1994). The agoraphobia section of the CIDI is separate from the PD section and for the present study, only the outcome of the agoraphobia section was considered. The CIDI yields a dichotomous outcome: diagnosis or no diagnosis. The interview was administered by phone by a trained interviewer. Diagnostic interviews by telephone give highly similar results compared to face-to-face interviews (Rohde, Lewinsohn, & Seeley, 1997).

*Other variables*
Other variables assessed included gender, age, nationality and education. Suicide risk was measured using 5 self-report questions derived from the Mini-International Neuropsychiatric Interview (MINI) (Lecrubier, et al., 1997; Sheehan, et al., 1998).

4. Procedure
Candidates for RCT participation completed a battery of online questionnaires. Questions on demographic data preceded the PDSS-SR, which was followed by the questions pertaining to suicide risk. Applicants who met the criteria based on the PDSS-SR and suicide risk scores were included in the sample, and they proceeded to complete questionnaires that assessed baseline values for the RCT outcome variables. These data are not reported in this paper. Each page of the demographics and mental health questionnaires contained two or three items. The VS-CMD was filled in last, with each page displaying only one item. Subjects could go back to
previous questions, but could not go forward before answering the current question. Completing all questionnaires took about 20 minutes. Data were stored digitally in a non-public database requiring a user name and password to access.

Within two weeks after completing the VS-CMD and other questionnaires, each RCT participant was phoned for the CIDI and was randomly allocated immediately thereafter to the intervention group or the control group. All data used in the current paper were collected before randomisation.

5. Analyses

First, the sensitivity and specificity of the VS-CMD agoraphobia item were calculated by comparing the participants’ scores to their CIDI diagnoses. This was also done for PDSS-SR-4. There is no consensus on which levels of sensitivity and specificity are acceptable, because those depend on the purpose, costs and benefits of the test (N. Smits, Smit, Cuijpers, & De Graaf, 2007). Since the purpose of the Visual Screener is to detect clinically relevant problems, and not only full-blown disorders, sensitivity values of .70 or higher and specificity values of .40 or higher were considered satisfactory.

Second, the area under the ROC curve (AUC) was established for VS-CMD item 5, PDSS-SR-4, PDSS-SR-5 and PDSS-SR items 4 and 5 combined. The combination of PDSS-SR items 4 and 5 was tested because the combined items could have potentially yielded a larger AUC than the individual items. The AUC is a measure of validity established by plotting a measure’s sensitivity against 1 – specificity. It can range from .500 (worthless test) to 1 (perfect test). Areas under the curve of .500 – .700 are said to reflect low accuracy, .700 – .900 moderate accuracy and .900 – 1.000 high accuracy (Swets, 1988). Differences between the AUCs of the different items were calculated using the formula of Hanley and McNeil (1983).

Other analyses included mean scores for demographics and mean time to complete the VS-CMD. For all analyses, alpha was set at .05. Analyses were conducted with SPSS for Windows, version 17.

Results

1. Sample

Of 368 applicants for the RCT, 85 (23%) were included in the present study. Of those who completed the screening questionnaires, 105 did not meet the RCT inclusion criteria and 56 withdrew or could not be contacted by the interviewer.
Table 1. Demographics (n = 85).

<table>
<thead>
<tr>
<th></th>
<th>m (SD)</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age</td>
<td>35.7 (11.1)</td>
<td></td>
</tr>
<tr>
<td>Gender: female</td>
<td></td>
<td>59 (69)</td>
</tr>
<tr>
<td>Born in the Netherlands</td>
<td></td>
<td>78 (92)</td>
</tr>
<tr>
<td>High education</td>
<td></td>
<td>42 (49)</td>
</tr>
<tr>
<td>Prevalence of panic disorder (diagnosed with CIDI)</td>
<td>64 (75)</td>
<td></td>
</tr>
<tr>
<td>Prevalence of agoraphobia (diagnosed with CIDI)</td>
<td>53 (62)</td>
<td></td>
</tr>
</tbody>
</table>

Figure 2. Flow chart.

Data of 58 participants could not be saved or were lost due to a mistake by the company hosting the VS-CMD database. See Figure 2 for a flow chart. Of the 85 participants in the ultimate sample, 64% were female and the age range was 19 to 60 (mean = 35.7, SD = 11.1). Most (92%) were born in the Netherlands and 49% had academic degrees (equivalent of bachelor’s or higher) (Table 1).

2. Predictive validity of PDSS-SR
In the CIDI interviews, 53 participants were diagnosed with agoraphobia. At a cut-off score of 2, PDSS-SR item 4 screened 21 participants positively for agoraphobic
symptoms, corresponding to a sensitivity of .32, a specificity of .88 and an AUC of .684 (95% CI: .568 – .810; see Table 2 and Figure 3). The optimal cut-off point for PDSS-SR-4 was 1, which has a sensitivity of .76 and a specificity of .56. Item 5 of the PDSS-SR predicted agoraphobia poorly, with an AUC of .607 (95% CI: .484 – .730; Figure 3); its optimal cut-off was 1, with a sensitivity of .42 and a specificity of .81. Combining item 4 and 5, predictive validity was slightly improved to an AUC of .697 (95% CI: .583 – .810; Figure 3).

3. Predictive validity of VS-CMD
The VS-CMD agoraphobia item identified 54 participants as reflecting possible cases of agoraphobia. The sensitivity of the VS-CMD agoraphobia item was .81, the specificity .66 and the AUC .734 (95% CI: .619 – .849), indicating moderate accuracy (Swets, 1988)(see Table 3 and Figure 3). The VS-CMD item predicted agoraphobia slightly better than PDSS-SR-4 (agoraphobic avoidance), although this difference (mean difference = 0.05) was not significant ($z = 0.61$, $p = .27$). PDSS-SR-5 (interoceptive avoidance) yielded a lower AUC than the VS-CMD, but this difference (0.127) was short of significance ($z = 1.57$, $p = .06$).

4. Completion time for VS-CMD
The entire VS-CMD was completed by 66% of the participants ($n = 58$) in 2 to 3 minutes. The overall average was 3.6 minutes (SD = 3.7). Completion times did not differ by gender ($t = -.267$, $p = .79$), but did slightly correlate with age ($r = .27$, $p = .01$), with a higher age associated with a longer time to complete.

<table>
<thead>
<tr>
<th>Table 2. Agoraphobia outcomes of PDSS-SR item 4 and CIDI, cut-off = 2. $n = 85$. Sensitivity = .32, specificity = .88</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIDI agoraphobia positive</td>
</tr>
<tr>
<td>--------------------------</td>
</tr>
<tr>
<td>PDSS-SR agoraphobia positive</td>
</tr>
<tr>
<td>PDSS-SR agoraphobia negative</td>
</tr>
</tbody>
</table>
Table 3. Agoraphobia outcomes of VS-CMD item 5 and CIDI. \( n = 85 \). 
Sensitivity = .81, specificity = .66

<table>
<thead>
<tr>
<th></th>
<th>CIDI agoraphobia positive</th>
<th>CIDI agoraphobia negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>VS agoraphobia positive</td>
<td>43</td>
<td>11</td>
</tr>
<tr>
<td>VS agoraphobia negative</td>
<td>10</td>
<td>21</td>
</tr>
</tbody>
</table>

Figure 3. ROC Curves of VS-CMD item 5, PDSS-SR-4, PDSS-SR-5, and PDSS-SR items 4 and 5 combined.


Discussion

The audiovisual agoraphobia item of the Visual Screener for Common Mental Disorders (VS-CMD) could be a valid instrument to screen for agoraphobic
symptoms. In the current sample of people with panic symptoms, it predicted the outcome of a diagnostic interview with moderate sensitivity and specificity. In terms of AUC, it performed slightly better than PDSS-SR-4, though not significantly. PDSS-SR-5 performed poorly. A combination of PDSS-SR items 4 and 5 might slightly improve the ability of the PDSS-SR to screen for (full-blown) agoraphobia. The multimedia VS-CMD item screened for agoraphobia at least as well as the text-based PDSS-SR agoraphobia items combined, despite the VS-CMD item’s minimal text and dichotomous outcome. The entire 12-item VS-CMD is a brief assessment, taking about 3 minutes to complete, which is about 15 seconds per item. These results indicate the VS-CMD could be just as valid as text-based instruments, while it should be more intelligible for people with difficulty reading due to its reliance on images and audio.

In this study, the sensitivity of PDSS-SR-4 was very low at cut-off point 2. Perhaps the cut-off point could be lowered to 1 at the expense of specificity. It has been argued that while the PDSS-SR is a valid questionnaire, it is advisable not to rely on its single items (Wuyek, et al., 2011). In the RCT from which we obtained the data for the current study, PDSS-SR-4 was used to stratify the randomisation for agoraphobia. Our results imply that VS-CMD item 5 would have been an equally good or better predictor of agoraphobia diagnosis in the sample.

The psychometric properties of the multimedia VS-CMD agoraphobia item (sensitivity .81, specificity .66 and AUC .734; 95% CI: .619 – .849) were found to be comparable to those of the text-based items for the various disorders on the Web Screening Questionnaire (WSQ; sensitivity .72 to 1.00, specificity .44 to .77, AUC .65 to .82 (Donker, et al., 2009)). According to the Donker study, the WSQ agoraphobia item had good sensitivity (1.00), moderate specificity (.63) and a moderate AUC (.81; 95% CI .73 – .90). The VS-CMD item also has comparable psychometric properties to a 5-item pencil-and-paper questionnaire, the Fear Questionnaire agoraphobia sub-scale (Marks & Mathews, 1979). In a clinical sample and at an optimal cut-off point of 6, that sub-scale has been found to have a sensitivity of .74 and a specificity of .72, with no AUC reported (Hoyer, Becker, Neumer, Soeder, & Margraf, 2002). A more accurate self-report instrument for agoraphobia is the Mobility Inventory (Chambless, Caputo, Jasin, Gracely, & Williams, 1985; Chambless, et al., 2011), especially the alone sub-scale. This sub-scale consists of 28 items and predicts the diagnosis of agoraphobia with sensitivity .87 and specificity .73. Comparisons between the VS-CMD and other questionnaires (Chambless, et al., 2011; Donker, et al., 2009; Hoyer, et al., 2002) have limited meaning here, as the instruments were tested in samples with characteristics different from those of the present sample.
Our results contained 11 false positives for the VS-CMD. That is, 11 participants clicked ‘yes’ on the VS-CMD agoraphobia item but had not been diagnosed with agoraphobia in the CIDI interviews. This might suggest that the agoraphobia item addresses a common fear that is not always associated with agoraphobia, perhaps caused by the brevity of the item. During the development of the VS-CMD, it was challenging to translate a mental disorder into a single question and images or animations. The DSM-IV-TR definition of agoraphobia contains the element of fear of panic-like symptoms, which is not covered by the VS-CMD agoraphobia item. On the other hand, the false positives could also indicate that 11 participants had sub-clinical agoraphobia symptoms that do not meet CIDI criteria for a diagnosis but could still be clinically relevant. Further research into the validity of the VS-CMD should employ continuous scale measures that gauge the severity of symptoms, enabling the VS-CMD screening items to be compared with various symptom severity cut-off points.

This study has a number of limitations. First, the VS-CMD was completed after all other questionnaires (except for the diagnostic interview). This could have biased results, as participants were already aware what kinds of symptoms were being queried. Second, PDSS-SR-4 rates agoraphobic avoidance in relation to panic attacks or fear of them, whereas VS-CMD item 5 rates agoraphobic fear. Yet the comparison between these items is valid, because all participants suffered from either panic attacks or fear of panic. Third, the 12-month prevalence version of the CIDI was used, whereas the VS-CMD and the PDSS-SR assess the current state of symptoms. This implies that the sensitivity and AUCs of both the VS-CMD and the PDSS-SR items might have been higher than the outcomes suggest. Fourth, our sample was limited to people with mild to moderate panic symptoms, and the results should therefore be generalised with caution. Samples selected for other anxiety disorders or with more severe symptoms might have yielded other outcomes. Finally, the study sample consisted of Dutch people, of which half was highly educated. Considering the VS-CMD is probably most suited for people who have difficulty reading, this is an important limitation. Nevertheless, the present results show that the VS-CMD measured what it was intended to measure.

Future research should validate the other VS-CMD items, in both patient populations and the general population, in order to obtain more widely applicable results. If the VS-CMD proves a valid instrument, it could be applied on internet portals for mental health issues in order to direct help-seekers to appropriate information or to screen applicants on eligibility criteria for online interventions. It could also be an alternative to text-based questionnaires for people with low reading levels and/or various cultural backgrounds. Very little is known about the
assessment of mental health problems among low socio-economic, illiterate and immigrant groups, perhaps because existing psychometric instruments are difficult to understand or unsuitable in other ways (C. H. Smits, De Vries, & Beekman, 2005) or because the groups are under-represented in research samples. The Center for Epidemiologic Studies Depression Scale (CES-D) (Radloff, 1977) has been shown by a Dutch study (Spijker, et al., 2004) to be a valid measure of depression among elderly Turkish and Moroccan immigrants provided the items were read aloud to participants. Research on the validity and utility of audiovisual screening for psychological problems in different social groups is limited. Validity can be established only if an instrument can be compared to another measure that has already been tested in the group being studied. The lack of suitable instruments is one reason why the VS-CMD was developed.

Multimedia screening is a promising area for future research. This study shows that screening for agoraphobia may be possible using a single multimedia item. The text-based PDSS-SR-4 may also be a valid measure. Both items could be used to screen for agoraphobia, while the VS-CMD item has the advantage that it could be administered to people who have difficulty reading. Research into the validity of internet-based screening instruments and single-item screening is still scarce, and more needs to be learned about the use of media other than text to screen for anxiety disorders. Further development of multimedia screening and treatment of mental disorders should be encouraged.

References


Inventory for Agoraphobia. Behav Res Ther, 23(1), 35-44.


Chapter 3

Internet-based screening for suicidal ideation in common mental disorders

Published as:
Abstract

Background
Common mental disorders have been found to be related to suicidal ideation and behaviour. Research in the field of internet-based interventions for common mental disorders, however, usually excludes participants with a suicidal risk, although a large proportion of participants might suffer from suicidal ideation.

Aims
To investigate the prevalence of suicidal ideation in common mental disorders in an online sample.

Method
In total, 502 participants completed nine internet-based questionnaires on common mental disorders, of which 120 were also interviewed by telephone to obtain a diagnosis. Logistic regression analyses were applied to investigate associations between disorders and suicidal ideation.

Results
Based on internet-based self-report, 53% of participants had some form of suicidal ideation. Fewer participants reported suicidal ideation during the interview by telephone. Depression (multivariate odds ratio 7.1), generalised anxiety disorder (2.1), social phobia (2.1), and post-traumatic stress disorder (1.7) were significantly associated with suicidal ideation, while a higher number of comorbid common mental disorders increased the risk.

Conclusion
Researchers and clinicians should be aware that one out of every two help-seekers on the internet with common mental disorders may have suicidal ideation. Comorbidity of two or more disorders greatly increase the risk of suicidal ideation.
Background

Internet-based treatments for mental health problems are becoming increasingly popular. These easily accessible interventions seem to be particularly effective for treating common mental disorders, like minor and major depressive disorder, anxiety disorders, and alcohol abuse (Cuijpers, et al., 2009; Riper, 2008; Spek, et al., 2007). Research in the field of internet-based interventions for common mental disorders, however, tends to exclude participants with a suicidal risk (e.g., Andersson, et al., 2005, 2006; Carlbring, et al., 2006; Hirai & Clum, 2005; Knaevelsrud & Maercker, 2007; Marks, Kenwright, McDonough, Whittaker, & Mataix-Cols, 2004). The reasons for exclusion are usually not stated, but many internet-based interventions were developed for the prevention or treatment of mild symptoms, so the mental health problems of suicidal participants might be considered too severe. Moreover, participants with a suicidal risk might be excluded because there is little to no actual therapist contact, or it is not considered ethical to include them in an experiment.

However, exclusion based on suicidal risk does not exclude participants with suicidal ideation. Suicidal ideation, defined as all mental processes that centre on conducting self-injurious behaviour or killing oneself (Kerkhof, 2010), might be highly prevalent among help-seekers on the internet. Several studies among the general population show that common mental disorders are related to suicidal ideation and behaviour (odds ratios [OR] of 2.7 to 10.6; Cougle, Keough, Riccardi, & Sachs-Ericsson, 2009; Nock, Hwang, Sampson, & Kessler, 2009; Sareen, et al., 2005). Among people with two or more disorders, OR of 6.7 to 29.0 are found when compared with people without disorders (Nock, et al., 2009; Sareen, et al., 2005). Although these studies were conducted in face-to-face interviews among the general population, the evidence suggests that internet interventions for common mental disorders target groups that might include a large proportion of individuals with suicidal ideation.

Research into internet interventions usually employs internet-based self-report measures for screening, inclusion criteria, and measuring effects of treatments. Some studies indicate that respondents score higher on internet-based questionnaires than on pencil-and-paper questionnaires or interviews (Cuijpers, Boluijt, & Van Straten, 2008; Donker, Van Straten, Marks, & Cuijpers, 2010; Whitehead, 2007), perhaps because internet-based testing is more anonymous. This could be especially true for topics that are more personal, like suicidal thoughts.

This study investigates the prevalence of suicidal ideation among common mental disorders through internet-based assessment. We also compare the
prevalence of suicidal ideation measured by an internet-based 1-item screening question with the prevalence obtained by a diagnostic interview that assesses DSM-IV psychiatric disorders.

Methods

Data are derived from a study into the psychometric properties of a new internet-based screening tool for common mental health problems, the Web Screening Questionnaire for Common Mental Disorders (WSQ; Donker, Van Straten, Marks, & Cuijpers, 2009). The study protocol was approved by the Medical Ethical Committee at the VU Medical Centre in Amsterdam, The Netherlands.

Recruitment

Participants were recruited between May and December 2007 from the general Dutch population by using internet banners on Google, websites on mental health issues and the VU University research page. The advertisements linked to a web page containing information about common mental disorders, internet treatment and internet-based screening, an application form, and a link to a battery of self-report questionnaires about common mental disorders. People were invited to participate if they felt depressed, anxious, distressed, or if they thought they were drinking too much alcohol. Participants were told in advance that completers of the questionnaires would be offered a self-help book for common mental problems.

Population

In all, 687 people applied for the study, of whom 185 (27%) were excluded because there was no written informed consent or in the end they refused to participate. This left 502 participants. These 502 participants submitted demographic information and filled in nine internet-based questionnaires on common mental disorders. A sub-sample also received a diagnostic interview by telephone. This sub-sample consisted of 120 participants who consented to the interview, could be contacted, and suffered from depressive symptoms without reporting a high suicide risk. Depressive symptoms was an inclusion criterion for this sub-sample, because due to the structure of the interview, the item concerning suicidal ideation could only be administered to people who indicated depressive symptoms. Participants with high suicide risk (WSQ item 15 score 3; n = 13) were not administered the diagnostic interview, because the questions concerning their symptoms could be too intrusive.
Instruments
Symptoms were measured with the following instruments; Dutch translations were used.

Suicidal Ideation - The Web Screening Questionnaire for Common Mental Disorders (WSQ) (Donker, et al., 2009) is based on the Screening Questionnaire (Gega, Kenwright, Mataix-Cols, Cameron, & Marks, 2005). It contains 15 multiple choice items and screens for common mental disorders. Item 15 assesses suicidal ideation with the following question: Has the idea of harming yourself or taking your own life recently come into your mind? Definitely not (score 0); Has crossed my mind, but I would not do it (score 1); I seriously considered it, but I stopped myself (score 2); and I would do it given the opportunity (score 3). This item was derived from the Screening Questionnaire, which showed high sensitivity (Gega, et al., 2005).

Among the sub-sample, suicidal ideation was also measured with the CIDI version 2.1, 6-month prevalence (World Health Organisation, 1997). Item E19 specifically measures suicidal ideation. The sub-sample consisted of participants who, during the CIDI interview, indicated that they had experienced a period of 2 weeks or more during which they have felt down, depressed, or lost interest (item E1). Subsequently, item E19 measures suicidal ideation by asking whether during such a period the participant has felt so down that he or she often thought about committing suicide.

Depressive Symptoms - The Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977) has 20 self-rated items each scored 0–3; total score range is 0–60. Psychometric properties are good with a cut-off score of 16 (Beekman, et al., 1997).

Generalised Anxiety Disorder (GAD) - The Generalised Anxiety Disorder Assessment (GAD-7; Spitzer, Kroenke,Williams, & Lowe, 2006) measures symptoms of generalised anxiety. Each of its 7 questions is rated 0–3 (not at all to nearly every day). The total score range is 0–21. Reliability is excellent (Cronbach $\alpha = .92$). With a cut-off point of $\geq 10$, sensitivity is 0.89 and specificity is 0.82 among primary-care participants (Spitzer, et al., 2006).

Panic Disorder - The Panic Disorder Severity Scale Self-Report (PDSS-SR; Houck, Spiegel, Shear, & Rucci, 2002; Shear, et al., 2001) asks 7 questions about 7 dimensions of panic disorder, each self-rated 0–4, with a total score range of 0–28. With a cut-off score of 8, sensitivity is 0.83 and specificity is 0.64 (Shear, et al., 2001).

Agoraphobia and Social Phobia - The Dutch version of the Fear Questionnaire (FQ) (Marks, & Mathews, 1979) detects agoraphobia, social phobia,
and blood-injury phobia. The FQ’s total phobia scale contains 15 items, each self-rated 0–8. The total score range is 0–120. Several studies support the validity of the FQ’s social and agoraphobia sub-scales (Cox, Parker, & Swinson, 1996; Cox, Swinson, & Shaw, 1991; Hoyer, Becker, Neumer, Soeder, & Margraf, 2002; Van Zuuren, 1988). Only the items concerning agoraphobia and social phobia were used here.

Specific Phobia - In this study, specific phobia was measured with the WSQ (Donker, et al., 2009). The WSQ specific phobia sub-scale has a sensitivity of .80 and a specificity of .40.

Post-traumatic Stress Disorder (PTSD) - The Impact of Events Scale (IES; Horowitz, Wilner, & Alvarez, 1979) assesses the signs and symptoms of avoidance and intrusion after a serious or traumatic life event. It has 15 items, each self-rated 0–5, with a total score range of 0–75. People who score ≥ 26 are likely to have PTSD.

Obsessive Compulsive Disorder (OCD) - We used the 10-item severity sub-scale of the Yale-Brown Obsessive-Compulsive Scale (YBOCS; Goodman, Price, Rasmussen, Mazure, Delgado, et al., 1989; Goodman, Price, Rasmussen, Mazure, Fleischmann, et al., 1989). Each self-rated item is rated 0–4, total score range 0–40. Cronbach’s α of the internal consistency of the total scale (Dutch version) is 0.69 to 0.91, and it converges well with several measures often used to assess OCD (De Haan, et al., 2006). A total score ≥ 13 denotes clinically significant obsessive-compulsive symptoms (Van Oppen, Van Balkom, De Haan, & Van Dyck, 2005).

Alcohol Abuse/Dependence - The Dutch version of the WHO’s self-rated Alcohol Use Disorders Identification Test (AUDIT; Saunders, Aasland, Babor, De la Fuente, & Grant, 1993) identifies people with hazardous alcohol consumption and dependence in primary care. Each of its 10 items is rated 0–4, total score range being 0–40. Cronbach’s α is 0.65 to 0.93, overall sensitivity is 0.92 and specificity is 0.94 (Saunders, et al., 1993). A cut-off score of 8 is recommended for various endpoints like alcohol-related social problems or medical problems (Conigrave, Saunders, & Reznik, 1995).

Burnout - Regarding burnout, we used the Utrechtse Burnout Scale (UBOS; Schaufeli & Van Dierendonck, 2000), which contains 15 items and has subscales regarding physical exhaustion, distance, and competence. Item responses are on a 6-point scale (never to daily/always). Raw scores are interpreted with a 5-point norm scale (very low to very high) and for each sub-scale compared with age- and sex-specific criteria. Cronbach’s α ranges between .75 and .88 (Schaufeli & Van Dierendonck, 2000). Convergent validity for the sub-scale physical exhaustion
is satisfactory, albeit somewhat less satisfactory for the other sub-scales.

Table 1. Has the idea of harming yourself or taking your own life, recently come into your mind? \((n = 502)\)

<table>
<thead>
<tr>
<th></th>
<th>n (%)</th>
<th>Men (%)</th>
<th>Women (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definitely not ( (score 0) )</td>
<td>234 (46.6)</td>
<td>97 (44.7)</td>
<td>137 (48.1)</td>
</tr>
<tr>
<td>Has crossed my mind but I would not do it ( (score 1) )</td>
<td>196 (39.0)</td>
<td>83 (38.2)</td>
<td>113 (39.6)</td>
</tr>
<tr>
<td>I seriously considered it but I stopped myself ( (score 2) )</td>
<td>59 (11.8)</td>
<td>29 (13.4)</td>
<td>30 (10.5)</td>
</tr>
<tr>
<td>I would do it given the opportunity ( (score 3) )</td>
<td>13 (2.6)</td>
<td>8 (3.7)</td>
<td>5 (1.8)</td>
</tr>
<tr>
<td>Total suicidal ( (score 1-3) )</td>
<td>268 (53.3)</td>
<td>120 (55.3)</td>
<td>148 (51.9)</td>
</tr>
<tr>
<td>Total ( (n=502) )</td>
<td>502</td>
<td>217</td>
<td>285</td>
</tr>
</tbody>
</table>

Analyses

First, the WSQ question about suicidal ideation was compared with the CIDI item concerning suicidal ideation among the sub-sample. A paired samples t-test was used to compare the WSQ scores with the interview scores.

Second, we divided participants in suicidal \( (score 1, 2, or 3 on the WSQ suicide item) \) and non-suicidal \( (score 0) \) groups. Scores on the other screening questionnaires were also dichotomised. This analysis was chosen for better comparison with other research. Using suicidal ideation as a dependent variable in a univariate regression analysis, we calculated OR for the screening questionnaires and several demographic variables. Variables that showed a significant risk at suicidal ideation were further analysed in a multivariate model to assess individual risks at suicidal ideation.

Because suicidal behaviour (suicides, suicide attempts) is related to sex, we might expect suicidal ideation to be related to sex as well. We examined the effects of sex on suicidal ideation using multiple logistic regression analysis. Interaction variables were made for this analysis.

Finally, we investigated the effect of comorbidity on suicidal ideation. Participants were divided in six groups, based on the number of comorbid disorders. The odds ratios were computed or each group. All analyses were conducted with SPSS 16.
Results

In total, 502 people participated in this study. The mean age was 43, and 57% of the participants were female. In all of the analyses, a distinction was made between suicidal participants (score 1, 2, and 3 on WSQ suicide; \( n = 268, \) 53.4%) and non-suicidal participants (score 0, \( n = 234, \) 46.6%); see Table 1 and Table 2.

<table>
<thead>
<tr>
<th></th>
<th>All</th>
<th>Not suicidal</th>
<th>Suicidal</th>
<th>( P )-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total: count (%)</td>
<td>502 (100%)</td>
<td>234 (46.6%)</td>
<td>268 (53.4%)</td>
<td>-</td>
</tr>
<tr>
<td>Gender: male</td>
<td>43.2%</td>
<td>41.5%</td>
<td>44.8%</td>
<td>ns</td>
</tr>
<tr>
<td>Mean age (SD)</td>
<td>43 (12.5)</td>
<td>42.5 (14)</td>
<td>43 (11)</td>
<td>ns</td>
</tr>
<tr>
<td>Ethnicity: Dutch</td>
<td>94.4%</td>
<td>93.6%</td>
<td>95.1%</td>
<td>ns</td>
</tr>
<tr>
<td>Marital state: single, divorced, widowed(^1)</td>
<td>52%</td>
<td>46.6%</td>
<td>56.7%</td>
<td>0.02</td>
</tr>
<tr>
<td>Low education(^2)</td>
<td>44.2%</td>
<td>39.7%</td>
<td>48.1%</td>
<td>ns</td>
</tr>
<tr>
<td>Unemployed</td>
<td>37.1%</td>
<td>32.5%</td>
<td>41%</td>
<td>0.048</td>
</tr>
<tr>
<td>Depression (CES-D ( \geq 16 ))</td>
<td>78.7%</td>
<td>59.8%</td>
<td>95.1%</td>
<td>(&lt; 0.01 )</td>
</tr>
<tr>
<td>alcohol abuse/dependence (AUDIT ( \geq 8 ))</td>
<td>54.2%</td>
<td>51.7%</td>
<td>56.3%</td>
<td>ns</td>
</tr>
<tr>
<td>PTSD (IES ( \geq 26 ))</td>
<td>36.7%</td>
<td>24.8%</td>
<td>47%</td>
<td>(&lt; 0.01 )</td>
</tr>
<tr>
<td>GAD (GAD-7 ( \geq 10 ))</td>
<td>56.2%</td>
<td>37.2%</td>
<td>72.8%</td>
<td>(&lt; 0.01 )</td>
</tr>
<tr>
<td>Panic disorder (PDSS ( \geq 8 ))</td>
<td>31.5%</td>
<td>23.1%</td>
<td>38.8%</td>
<td>(&lt; 0.01 )</td>
</tr>
<tr>
<td>Agoraphobia (part FQ ( \geq 19 ))</td>
<td>12.4%</td>
<td>9.8%</td>
<td>14.6%</td>
<td>ns</td>
</tr>
<tr>
<td>Social phobia (part FQ ( \geq 14.75 ))</td>
<td>31.5%</td>
<td>17.9%</td>
<td>43.3%</td>
<td>(&lt; 0.01 )</td>
</tr>
<tr>
<td>Specific phobia (WSQ question 7 ( = 34.3))</td>
<td>12.9%</td>
<td>6.8%</td>
<td>18.2%</td>
<td>(&lt; 0.01 )</td>
</tr>
<tr>
<td>OCD (YBOCS ( \geq 12 ))</td>
<td>12.9%</td>
<td>6.8%</td>
<td>18.2%</td>
<td>(&lt; 0.01 )</td>
</tr>
<tr>
<td>Burn-out (UBOS)</td>
<td>44.0%</td>
<td>34.6%</td>
<td>52.2%</td>
<td>(&lt; 0.01 )</td>
</tr>
</tbody>
</table>

\( ns \): not significant
\(^1\): Versus cohabiting or married
\(^2\): High education is defined as admissible to a university, or the equivalent of a bachelor's degree or higher.

The sub-sample that consisted of participants with depressed symptoms and who took part in the CIDI interview (\( n = 120 \)) was comparable with the total sample in
mean age (44) and percentage that was female (58%). Of this sub-sample, 52.5% reported suicidal ideation on the WSQ item against 24.3% on the CIDI item ($t = -5.33, p < .001$).

In the univariate regression, the greatest association of suicidal ideation was with depression (OR 13.2), followed by GAD (OR 4.5), social phobia (OR 3.5), and OCD (OR 3.0); see Table 3. The multivariate odds ratios showed the greatest associations with, in order of importance, depression (OR 7.1), GAD (OR 2.1), social phobia (OR 2.1), PTSD (OR 1.7), and not having a partner (OR 1.6). More comorbid disorders were associated with more suicidal thoughts (OR 6.7 to 43.5; see Table 4).

Unemployment, panic disorder, OCD and burnout give significant odds ratios in the univariate analysis, though not in the multivariate regression. An investigation of the sex-specific influence on suicidal ideation showed that depression had a larger association with suicidal ideation in women than in men (OR 4.4, 95% CI 1.1–18.1; not in table).

**Discussion**

Of the 502 people seeking help on the internet for common mental health problems, 53% reported suicidal ideation. Of the CIDI telephone interviewed depressed sub-sample, 53% reported suicidal ideation on the online self-report item, compared with 24% on the interview by telephone. Concerning the risk factors, the following results are found. Depression has a strong association with suicidal ideation, but also GAD, social phobia, PTSD, and/or not having a partner are significantly associated with suicidal ideation. Moreover, suicidal ideation is strongly related to comorbidity of several common mental disorders.

**Internet-Based Screening for Suicidal Ideation**

Among the sub-sample that was interviewed by telephone, more participants reported suicidal ideation when self-tested online with WSQ item 15 than when asked with item E-19 of the CIDI depression section. This sample is limited in two ways. First, because of the structure of the CIDI, the sub-sample had to consist of participants with depressive symptoms to receive the questions about suicidal ideation. Second, the medical-ethical committee that approved the study allowed only participants who had scored lower than 3 on the WSQ suicide item to be interviewed (Donker, et al., 2009). In effect, this means the sub-sample consisted of participants with depressive symptoms but without suicidal risk. Nevertheless, the
Table 3. Univariate and multivariate odds ratios of disorders at suicidal ideation.

<table>
<thead>
<tr>
<th>Disorder</th>
<th>Univariate OR</th>
<th>Multivariate OR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender: male</td>
<td>1.1 (0.8-1.6)</td>
<td>1.2 (0.8-1.9)</td>
</tr>
<tr>
<td>Marital state: single, divorced, widowed³</td>
<td>1.5 (1.1-2.1)*</td>
<td>1.5 (1.0-2.3)*</td>
</tr>
<tr>
<td>Ethnicity: non Dutch</td>
<td>0.74 (0.4-1.6)</td>
<td>1.7 (0.7-4.0)</td>
</tr>
<tr>
<td>Low education²</td>
<td>1.4 (0.99-2.0)</td>
<td>0.8 (0.5-1.2)</td>
</tr>
<tr>
<td>Unemployed</td>
<td>1.4 (1.0-2.1)*</td>
<td>1.2 (0.7-1.9)</td>
</tr>
<tr>
<td>Depression (CES-D ≥16)</td>
<td>13.2 (7.1-24.4)*</td>
<td>7.1 (3.6-13.9)*</td>
</tr>
<tr>
<td>alcohol abuse/dependence (AUDIT ≥8)</td>
<td>1.2 (0.9-1.7)</td>
<td>1.4 (0.9-2.2)</td>
</tr>
<tr>
<td>PTSD (IES ≥26)</td>
<td>2.7 (1.8-3.9)*</td>
<td>1.7 (1.1-2.6)*</td>
</tr>
<tr>
<td>GAD (GAD-7 ≥10)</td>
<td>4.5 (3.1-6.6)*</td>
<td>2.1 (1.3-3.4)*</td>
</tr>
<tr>
<td>Panic disorder (PDSS≥8)</td>
<td>2.1 (1.4-3.1)*</td>
<td>1.1 (0.6-1.8)</td>
</tr>
<tr>
<td>Agoraphobia (part FQ ≥19)</td>
<td>1.6 (0.9-2.7)</td>
<td>0.6 (0.3-1.3)</td>
</tr>
<tr>
<td>Social phobia (part FQ: 14,75)</td>
<td>3.5 (2.3-5.3)*</td>
<td>2.1 (1.3-3.4)*</td>
</tr>
<tr>
<td>Specific phobia (WSQ question 7=1)</td>
<td>1.4 (0.99-2.1)</td>
<td>1.4 (0.9-2.2)</td>
</tr>
<tr>
<td>OCD (YBOCS≥12)</td>
<td>3.0 (1.7-5.5)*</td>
<td>1.6 (0.8-3.1)</td>
</tr>
<tr>
<td>Burnout (UBOS)</td>
<td>2.1 (1.4-3.0)*</td>
<td>1.3 (0.8-2.0)</td>
</tr>
</tbody>
</table>

OR: odds ratio
*: p ≤ .05
1: Versus cohabiting or married
2: High education is defined as admissible to a university, or the equivalent of a bachelor’s degree or higher.

Table 4. Percentage with suicidal ideation related to number of comorbid disorders.

<table>
<thead>
<tr>
<th>Disorder count</th>
<th>Percent with suicidal ideation</th>
<th>odds ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 and 1</td>
<td>6.5%</td>
<td>Reference</td>
</tr>
<tr>
<td>2</td>
<td>32.5%</td>
<td>6.7 (2.3-21.3)*</td>
</tr>
<tr>
<td>3</td>
<td>45.5%</td>
<td>12.1 (4.0-36.6)*</td>
</tr>
<tr>
<td>4</td>
<td>60.7%</td>
<td>22.4 (7.5-67.1)*</td>
</tr>
<tr>
<td>5</td>
<td>81.3%</td>
<td>63.2 (19.7-203.1)*</td>
</tr>
<tr>
<td>6 or more</td>
<td>75%</td>
<td>43.5 (14.5-130.3)*</td>
</tr>
</tbody>
</table>

*: Significant
sub-sample was comparable with the total sample in terms of mean age, sex, and degree of suicidal ideation. Moreover, the comparison between the WSQ and CIDI suicidal ideation items is made only within the sub-sample.

The internet-based self-report suicide item is stated a bit more moderately than the interview item for suicidal ideation. On the other hand, the WSQ measures the current state, while the CIDI covers the last 6 months. A larger number would be expected to report suicidal ideation at some time during the last 6 months opposed to a current state, but the data show the opposite. The large difference in reported suicidal ideation online compared with the interview might indicate that people find it easier to report mental problems online than to another person by telephone. This assumption would be in agreement with the literature (Cuijpers, et al., 2009; Donker, et al., 2009; Whitehead, 2007).

This study was performed in The Netherlands. It would be interesting to make a comparison with other countries. Therefore, replication of this study is suggested in other countries.

**Suicidal Ideation Among Common Mental Disorders**

In The Netherlands, a lifetime prevalence of suicidal ideation of 11% and a yearly prevalence of 3% is found (Bijl, Ravelli, & Zessen, 1998). Compared with the general population, this population with common mental problems has a very high prevalence of suicidal ideation. The associations between common mental disorders and suicidal ideation are comparable with those of other studies. Studies among the general population show that several anxiety disorders have a significant link with suicidal ideation and behaviour, while depression turns out to be the disorder with the highest association (Cougle, et al., 2009; Nock, et al., 2009). Regarding these associations, the internet sample of the current study is comparable with the general population.

Contrary to the literature, in our sample alcohol abuse/dependence does not relate to suicidal ideation, and panic disorder, burnout, and OCD showed no significant association in the multivariate analysis. An earlier study also found no significant link of alcohol problems or panic disorder to suicidal ideation (Sareen, et al., 2005), although other evidence suggests these disorders have a significant association (Cougle, et al., 2009; Nock, et al., 2009; Norton, Temple, & Pettit, 2008). The association of panic disorder with suicidal ideation may be mediated by depression (Norton, et al., 2008). The same might be true for OCD and burnout. As to alcohol abuse, it is known that alcohol has an influence on suicide attempts and completed suicide (Schneider, 2009). This influence could be mediated by aggression and impulsiveness. Our study indicates that, when one experiences
suicidal thoughts without acting on them, alcohol in itself might not be a factor of significance.

This study also shows that comorbidity increases the risk of suicidality. Suicidality would appear to indicate how much a person is suffering: The more disorders a person has, the more suffering the person experiences and hence the more suicidal ideation the person experiences.

Implications
Among people who seek help on the internet for common mental disorders, a large proportion could be suffering from suicidal ideation, with more comorbid mental health problems indicating more thoughts about suicide. Perhaps suicidal ideation is an indicator of the severity of one’s mental problems. When assessing or treating depressed, anxious, and other persons with common mental disorders through the internet, researchers and clinicians should be aware that one out of every two help-seekers may be experiencing suicidal ideation. Suicidal ideation should therefore be targeted both in the research as well as in the treatment of common mental disorders through the internet.

References


Chapter 4

The quality of online suicide prevention in the Netherlands and Flanders in 2007

Published as (in Dutch):
Abstract

The internet can provide valuable support for persons with suicidal tendencies. By means of the Google search engine we found and categorised 153 Dutch language websites dealing with suicide. The websites relating to suicide prevention (n = 23) were scored for quality against a list of 17 quality features. Results indicate that the standard of Dutch language suicide prevention websites is not optimal. Improvement is needed particularly in the field of online help, and interactive possibilities need to be extended.
Introduction

There are indications that the internet is an easily accessible source of help for suicidal people, as they are not always inclined to seek help from their General Practitioner (GP) or from mental health services (Harris, 2008). Reasons for this may include feelings of shame at having these thoughts, fear of being stigmatised or thinking that problems are unsolvable. It is, therefore, important that high quality and useful information on suicide, suicidal thoughts and suicidal behaviour is available on the internet. To date, little has been published concerning Dutch language online suicide prevention. A short overview from 2002 demonstrates that informative sites about suicide prevention are of reasonable quality (Degraeve & Pieters, 2002). Due to the rapid development of the internet, an update of the overview is required. We therefore carried out an investigation to address the following questions: what suicide-related websites are available in Dutch and what is the quality of suicide prevention websites?

Method

We searched for relevant websites on Google in October 2007. Four different searches were carried out, using the keywords ‘zelfmoord’ (common synonym for suicide), ‘ik wil dood’ (I want to die), ‘zelfdoding’ (more official synonym for suicide), ‘suïcide’ (official synonym for suicide). These searches were restricted to pages in the Dutch language. This method was intended to approximate the search method of a suicidal person, as well as to find more official websites. From the search results, the first 50 hits to be displayed were included. The websites found were viewed and put into an inventory using an adapted version of the classification system of Degraeve & Pieters (2002) (Table 1). Hits on different pages of the same website were categorised separately, but each page could only be included once in the list. Irrelevant and inaccessible sites were not taken into consideration.

Classification

Internet pages that offer help, advice and information for suicidal persons are classified as “suicide prevention”. Sub-categories employed were “personal” for personal accounts, “religious” for suicide prevention from a religious perspective and “organisation” for professional and voluntary help and support bodies. Sites of a purely informational nature were categorised as “articles”. Websites were
categorised as “pro-suicide” if suicide was recommended or glorified. Other pages were categorised as either “culture” (with the sub-categories “music”, “computer games”, "jokes", “literature” and “other”), “interactive communications” (mainly discussion forums), “blogs”, “news and media”, “religious” (for religious websites where suicide is written about without this being from a clear preventive viewpoint) or “other organisations”. This last category has been subdivided into the sub-categories “bereaved by suicide” and “other”.

Quality features
Seventeen quality features were formulated based on the check list of Degraeve & Pieters (2002), the warning signs for suicide of the American Association of Suicidology (Mandrusiak, et al., 2006), and information from principal chapters from the Handbook of suicidal behaviour (Eggermont, Van den Bulck & Kerkhof, 2007; Kerkhof, 2007; Maes & Kerkhof, 2007; Neeleman, 2007). Retrieved suicide prevention websites received a rating of –, 0 or + for each quality feature, which yielded respectively 0, 1 and 2 points.

Quality features coded included presence of general information about suicide and suicidal behaviour, whereby prevalence, causes, risk factors and symptoms should be described; mention of the twelve consensus warning signs of suicide (Mandrusiak, et al., 2006); and validation/acknowledgement that the situation of a suicidal person is serious, while not regarding it as hopeless. Advising not to harm oneself, accompanied by alternatives; inclusion of the consequences of suicidal behaviour, but in a non-judgemental way; and making it clear that suicidal thoughts are temporary in nature and can be treated, were also coded for. Recommendations and information regarding referrals to GPs or mental health services; telephone helplines; and websites of fellow sufferers, patient organisations, or the Dutch voluntary euthanasia society (NVVE) were coded for, as was the expertise of the organisation behind each website. Here, ‘expert’ was defined as being trained in the field of mental healthcare. Four features focusing on interactive help and support were included: the presence of 1) a self-test, 2) a chat room (for peer-support), 3) a moderated discussion forum and 4) the option of online help (e.g. crisis chat with a professional or internet-based intervention). This assessment took into account the level of professionalism and the extent to which use was made of these options. One-to-one chat with someone providing help and support was coded as online help rather than as a chat room. A further feature was the presence of information for family members of a suicidal person, and the final two included features referred to what should not be encountered on suicide prevention sites, being descriptions of suicide methods and propaganda in the
discussion forums and/or the contributions of members. Here, pro-suicide, pro-choice, anti-suicide and “pro-life” statements were counted as propaganda. If no discussion forum was present, a 0 was coded for this last feature.

Websites were regarded as satisfactory if more positive than negative characteristics were present. This came down to a score of 18 points. Ten suicide prevention sites were assessed by a second assessor, so that the level of agreement between the assessors could be established.

Table 1. Inventory of accessed suicide related websites (n = 153).

<table>
<thead>
<tr>
<th>Website category</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suicide prevention</td>
<td>23 (15)</td>
</tr>
<tr>
<td>Personal</td>
<td>1</td>
</tr>
<tr>
<td>Religious</td>
<td>5</td>
</tr>
<tr>
<td>Organisation</td>
<td>17</td>
</tr>
<tr>
<td>Articles</td>
<td>19 (12)</td>
</tr>
<tr>
<td>Pro-suicide</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Culture</td>
<td>25 (16)</td>
</tr>
<tr>
<td>Music</td>
<td>7</td>
</tr>
<tr>
<td>Computer games</td>
<td>3</td>
</tr>
<tr>
<td>Jokes</td>
<td>3</td>
</tr>
<tr>
<td>Literature</td>
<td>10</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
</tr>
<tr>
<td>Interactive communication</td>
<td>13 (18)</td>
</tr>
<tr>
<td>Blogs</td>
<td>1 (1)</td>
</tr>
<tr>
<td>News and media</td>
<td>47 (31)</td>
</tr>
<tr>
<td>Religious</td>
<td>2 (1)</td>
</tr>
<tr>
<td>Other organisations</td>
<td>23 (15)</td>
</tr>
<tr>
<td>Bereaved by suicide</td>
<td>12</td>
</tr>
<tr>
<td>Other</td>
<td>11</td>
</tr>
</tbody>
</table>

Results

The first 50 hits of each of the four searches led to 182 different internet pages, of which 3 were inaccessible and 26 were irrelevant. In total, 153 internet pages were categorised. The related inventory is provided in Table 1. The pages in
Table 2. Frequency of the quality features as percentages of the 23 suicide prevention websites, and separate rating and overall scores of the top 6.

<table>
<thead>
<tr>
<th>Frequency of the quality features</th>
<th>Total (n = 23)</th>
<th>Top 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>General information</td>
<td>13% 0 + 0 + + + 0</td>
<td></td>
</tr>
<tr>
<td>Warning signs</td>
<td>4% 0 0 0 0 + -</td>
<td></td>
</tr>
<tr>
<td>Taking seriously</td>
<td>48% + + + + 0 0</td>
<td></td>
</tr>
<tr>
<td>Advice not to engage in self-harming behaviour</td>
<td>26% + - + + - +</td>
<td></td>
</tr>
<tr>
<td>Pointing out consequences diplomatically</td>
<td>0% - 0 0 0 0 0</td>
<td></td>
</tr>
<tr>
<td>Describing temporary nature of suicidal thoughts</td>
<td>35% + + + + + +</td>
<td></td>
</tr>
<tr>
<td>Referrals to GP or mental health services</td>
<td>35% + + + + + +</td>
<td></td>
</tr>
<tr>
<td>Referral to telephone helplines</td>
<td>45% + + - + + -</td>
<td></td>
</tr>
<tr>
<td>Links to NVVE, Ex6, Pandora, Epsilon or Befrienders</td>
<td>17% + 0 - 0 + -</td>
<td></td>
</tr>
<tr>
<td>Organisation behind website</td>
<td>43% + + 0 + + 0</td>
<td></td>
</tr>
<tr>
<td>Self-test</td>
<td>4% + - - - - -</td>
<td></td>
</tr>
<tr>
<td>Discussion forum</td>
<td>35% + - - + - +</td>
<td></td>
</tr>
<tr>
<td>Chatroom</td>
<td>0% - - 0 - - 0</td>
<td></td>
</tr>
<tr>
<td>Online help</td>
<td>13% + + 0 - - +</td>
<td></td>
</tr>
<tr>
<td>Information for family members</td>
<td>30% + - + 0 + +</td>
<td></td>
</tr>
<tr>
<td>No descriptions of suicide methods</td>
<td>74% + + 0 + 0 +</td>
<td></td>
</tr>
<tr>
<td>No propaganda in discussion forum</td>
<td>35% + 0 + 0 0 +</td>
<td></td>
</tr>
<tr>
<td>Total score</td>
<td>26 22 21 21 20 19</td>
<td></td>
</tr>
</tbody>
</table>

NVVE=Dutch voluntary euthanasia society
* This website is no longer online
the category “culture”, sub-category “literature” consisted predominantly of poems which were posted on blogs. Only one blog was classified as “blog”.

The 23 websites for suicide prevention were then assessed for quality. The level of agreement between assessors was 89%. Out of the suicide prevention websites, 6 scored a satisfactory mark. Of these, 3 were from the Netherlands, and 3 were from Flanders. Table 2 provides the ratings and overall scores for the 6 satisfactory suicide prevention sites. These 6 stood out largely due to inclusion of these features: describing the temporary nature of suicidal thoughts, and referrals to the GP or mental health services. These 6 websites received a + rating for these features, as opposed to 12% of the 17 other suicide prevention sites. An investigation of which quality features occurred the most was also undertaken. Only + ratings were counted. These percentages are also included in Table 2.

**Discussion**

Many suicide-related websites exist in the Dutch language and 15% of these fall into the category of “suicide prevention”. The most numerous contain news reports, which make up 31% of the total. We did not encounter any pro-suicide websites.

With respect to the classification process of Degraeve & Pieters from 2002, it has turned out that there are now relatively more news reports to be found about suicide on the internet. The two investigations differed in terms of search method employed, however. A comparison between the present study and Degraeve & Pieters’ regarding website quality is not possible, because just two of the nine sites assessed in the previous study were included in the category of “suicide prevention”. This cannot be attributed solely to differences in search method, as some sites no longer exist or no longer offer information about suicide. Given the transitory nature of websites, this is not surprising.

Out of all the sites investigated in this study, only six were found to be satisfactory. The three Flemish sites from the top six stood out due to their professionalism and high quality information, while the three best Dutch sites focused more on support and interaction. A possible explanation for the difference in professionalism between Dutch and Flemish sites is that suicide prevention is supported by the Flemish authorities, but not by the Dutch authorities.

Nowhere did we find information targeting ethnic minority groups. Research has found that suicide attempts by Turkish and Surinamese females in the Netherlands are two to three times more frequent than by native females (Burger, Van Hemert, Bindraban & Schudel, 2005).
The suicide prevention sites investigated in this study have many negative points, indicating that improvement is needed. Important information, such as warning signs, is still lacking on the majority of sites, but, above all, the administrators of these sites should work on including more interactive options. More self-tests would be welcome, as would chat rooms supervised by professionals. Perhaps the most important recommendation is that the offer should be extended to include professional online help. Online help is not often available and exists predominantly in the form of chat rooms with a person providing support.

It is possible that not all Dutch language websites for suicide prevention were included in the inventory. Any websites not included were not captured by the search method used, suggesting that the administrators of these sites could consider enhancing the searchability of these sites.

There is still relatively little known about the positive and negative effects of internet usage by suicidal persons. The internet facilitates searching for help and support, but the risk of suicide may also be increased (Alao, Soderberg, Pohl & Alao, 2006). It is also not yet known to what extent suicidal persons are helped by suicide prevention sites and to what extent online help is effective with regard to suicidal thoughts or suicidal behaviour. More research is required. In the media and in some case studies, a predominantly negative picture is painted of internet usage by suicidal persons, due to the inciting effect or the danger of imitation. One should, however, not lose sight of the fact that the internet can also be an important medium for suicide prevention.

Conclusion

There are many Dutch language web pages available relating to suicide. The quality of Dutch language online suicide prevention would appear to be suboptimal. Above all, the areas of online help and interactive possibilities are in need of improvement. From the 23 suicide prevention websites examined, 6 were found to be satisfactory.

References

Harris, K. M. (2008). Suicidal tendencies online: taking a highway to help or catching a bus to oblivion. University of Queensland, Brisbane.
Chapter 5

The effects of an internet-based self-help course for reducing panic symptoms - Don't Panic Online: study protocol for a randomised controlled trial

Published as:
Abstract

Background
Internet-based self-help for panic disorder (PD) has proved effective. However, studies so far have focussed on treating a full-blown disorder. Panic symptoms that do not meet DSM-IV criteria are more prevalent than the full-blown disorder and patients with subclinical panic symptoms are at risk of developing PD. This study is a randomised controlled trial aimed to evaluate an internet-based self-help intervention for subclinical and mild PD compared with a waiting list control group.

Methods
Participants with mild or subclinical PD (n = 128) will be recruited in the general population. Severity of panic and anxiety symptoms are the primary outcome measures. Secondary outcomes include depressive symptoms, quality of life, loss of production and health care consumption. Assessments will take place on the internet at baseline and three months after baseline.

Discussion
Results will indicate the effectiveness of Internet-based self-help for subclinical and mild PD. Strengths of this design are the external validity and the fact that it is almost completely conducted online.

Trial registration
The Netherlands Trial Register NTR1639. The Netherlands Trial Register is part of the Dutch Cochrane Centre.
Background

Anxiety disorders are highly prevalent, affecting one in six people during their lifetime (Somers, Goldner, Waraich, & Hsu, 2006), and cause a substantial loss of quality of life (Batelaan, De Graaf, Van Balkom, Vollebergh, & Beekman, 2007). Direct and indirect costs caused by anxiety disorders are estimated at half a billion dollars per 1 million adults per year (Smit, et al., 2006). One of those anxiety disorders is panic disorder (PD). A study among the population in the Netherlands shows PD affects 1.5% of all adults each year, while 2% of the population is affected by subclinical PD (Batelaan, Smit, et al., 2007). Subclinical PD indicates infrequent panic attacks or frequent panic attacks that are relatively mild. It can be defined as panic symptoms that do not meet DSM-IV criteria for PD. Subclinical PD is a substantial burden for both the patient and society (Batelaan, Smit, et al., 2007). Panic symptoms are often comorbid with other mental health problems, like depression or other anxiety disorders (Kessler, Chiu, Demler, Merikangas, & Walters, 2005). Comorbid anxiety and depressive symptoms can lead to suicidal ideation (Norton, Temple, & Pettit, 2008) and PD elevates the risk at suicide attempts when comorbid with a mood disorder, substance abuse or another anxiety disorder (Nock, Hwang, Sampson, & Kessler, 2010).

While PD can be effectively treated with cognitive behavioural therapy and pharmacotherapy (Furukawa, Watanabe, & Churchill, 2006), it is known that only 25% of people with anxiety symptoms seek help (Roness, Mykletun, & Dahl, 2005) and only 15% of people with panic symptoms receive effective treatment (Craske & Zucker, 2001). Help-seeking might be too difficult or fearful for people with panic symptoms, especially when they suffer from agoraphobia as well. In addition, help-seeking could be further compromised by fear of stigmatisation, misinterpretation of panic symptoms as a physical problem, or little awareness of effective treatment opportunities or available services.

A more accessible and perhaps more acceptable alternative to face-to-face interventions for PD is internet-based self-help. Several studies show promising effects of computerised and internet-based self-help for PD (Carlbring, et al., 2006; Klein, Richards, & Austin, 2006; Marks, Kenwright, McDonough, Whittaker, & Mataix-Cols, 2004). Moreover, internet-based self-help courses save clinicians' time and cost little compared with face-to-face treatment or pharmacotherapy (Cuijpers, et al., 2009).

Internet based self-help interventions for panic symptoms focus mainly on full-blown PD (Carlbring, et al., 2006; Klein, et al., 2006). An accessible self-help course, tailored for the large group of subclinical and mild cases, would be
beneficial to a group of patients that is not yet targeted by internet interventions. Moreover, an internet-based self-help course for subclinical and mild panic symptoms could close the gap between prevention and early intervention of panic disorder.

This study is designed to evaluate Don’t Panic Online (Geen Paniek Online; Kramer, Conijn, Herzmanatus, & Riper, 2008), an internet-based self-help course for subclinical and mild cases of PD with minimal guidance. Don’t Panic Online (DPO) is based on Don’t Panic (Geen Paniek; Meulenbeek, Herzmanatus, Smit, Willensse, & Van der Zanden, 2005), a face-to-face group course for subclinical and mild panic symptoms. Don’t Panic has proved cost-effective (Meulenbeek, et al., 2010; Smit, et al., 2009).

We will conduct a randomised controlled trial, comparing an experimental group that takes the course Don’t Panic Online with a waiting list control group that will get access to an information website. The research question is the following: what is the effect of the internet-based self-help course Don’t Panic Online on subclinical to mild panic symptoms?

Methods

Design
We will conduct a randomised controlled trial with two arms: (a) internet-based self-help with minimal guidance, (b) waiting list control group with information website. The Medical and Ethical Committee of VU Medical Centre approved the study protocol.

Study population
The study population consists of adults with subclinical or mild PD. The inclusion criteria are the following: 18 years of age or older, internet access, subclinical or mild PD (PDSS-SR score 5-15). Consequently, individuals with too mild (PDSS-SR score 1-4) or too severe (PDSS-SR score 15 or higher) panic symptoms will be excluded. Participants who report moderate to high suicide risk, as measured by a self-report version of the MINI, will be excluded as well. Applicants who report severe panic symptoms or suicide risk will be contacted by email and advised to contact their general practitioner.

Sample size
Power calculations are based on a moderate effect size of $d = .50$, comparing the
PDSS-SR scores of the intervention group with the control group with a two-sided t-test (alpha .05, power 80%). To show this effect, each group will consist of 64 participants (Lipsey, 1993), so the total sample size adds up to n = 128. Missing values will be imputed.

Recruitment
Participants will be recruited in the general population by means of a Facebook advertisement campaign, messages on panic or anxiety related online forums, banners on health related websites and advertisements in newspapers. Interested individuals will be directed to a study website, where they can find further information as well as an informed consent form. They can apply for participation by printing and signing the informed consent form, which can be scanned and sent by email or sent by postal mail. After application, the researchers will send the participants a link to an online questionnaire.

Randomisation and procedure
After screening and completion of the baseline questionnaires (T0), the participant will be contacted for a diagnostic interview by telephone. The interview will be conducted within two weeks after baseline by a trained and experienced interviewer. All participants will be randomised to one of the two groups, regardless of the presence or absence of a diagnosis. Randomisation will be stratified for the presence or absence of agoraphobia symptoms (PDSS-SR item 4 score > 1) and the use of medication. Randomisation lists are generated with a computer program. Blinding of the participants and researchers is not possible due to the design of this study. The post-treatment assessment (T1) is scheduled at 3 months after baseline. Both the baseline and the post-treatment assessments are self-report and will be conducted through the internet.

Intervention
Don’t Panic Online (DPO) is an individual guided internet-based self-help course, based on cognitive behavioural therapy. It was developed by the Trimbos Institute, which is the Netherlands Institute for Mental health and Addiction, in collaboration with GGNet, a Dutch mental health care institute. The course consists of six sessions, in which the participants will learn to control their panic symptoms by applying various cognitive behavioural techniques and skills. The course’s format is based on Colour Your Life, an evidence based internet intervention for depressive symptoms (Spek, et al., 2008; Warmerdam, van Straten, Twisk, Riper, & Cuijpers, 2008).
DPO consists of the following components: keeping a log of panic attacks; analysis of fearful situations; challenging thoughts that enable feelings of panic; replacing these thoughts by more realistic, constructive thoughts that reduce anxiety; behavioural exercises; and ranking exercises from manageable to difficult and carrying them out in order of difficulty. Each session consists of text, voice over, animated diagrams and video. A typical session will take about thirty minutes and consists of an introduction, a discussion of the previous lesson’s homework, new theory and homework for the next week. The course is designed to be followed on a weekly basis until session five, while the sixth lesson can be followed four weeks after the fifth. The course can be completed in eight weeks.

Besides the lessons, the participant has several online resources at his or her disposal: a homework station, a panic attack log, a library for extra information, reading tips and a discussion board.

The DPO website contains an email system for contact between a participant and a coach. For the current study, the coach will reply to questions about the course, its exercises and the participant's mental health. He will also contact the user weekly to ask after his progress. Participants will be supported for a maximum of three months. The coaches will consist of students who are in the final phase of their study of clinical psychology. All will receive a brief training.

Participants in the control group will receive access to DPO after completing the T1 measurement. In the mean time, they will have access to an information website about PD.

**Instruments**

All variables will be measured at T0 and T1, except for demographic data, the diagnosis and satisfaction with the intervention. Demographic data and diagnosis are only measured at T0, while satisfaction with the intervention will only be measured at T1. Demographic data are gathered about age, gender, ethnicity, marital status and education.

The Composite International Diagnostic Interview (CIDI; Robins, et al., 1988) will be used to ascertain the presence or absence of PD, other anxiety disorders and depression. The CIDI has been developed by the WHO and is an extensive, fully structured diagnostic interview to assess DSM-IV Axis-I diagnoses (Robins, et al., 1988). Only the subscales depression, PD, agoraphobia, GAD, social phobia and post-traumatic stress disorder will be used in this study. The reliability of these subscales is sufficient (inter-rater χ = .94 - .99; test-retest χ = .62 - .84; Wittchen, 1994). In this study, a trained interviewer will administer the CIDI by telephone.
For severity of panic symptoms the Panic Disorder Severity Scale - Self Report (PDSS-SR) will be used. The PDSS is originally a face-to-face interview (Shear, et al., 2001) and was adapted to self-report (Houck, Spiegel, Shear, & Rucci, 2002). The instrument contains seven items that assess the severity of seven dimensions of panic disorder and associated symptoms. The PDSS-SR generates a total score ranging from 0 to 28, with a higher score indicating more severe panic symptoms. The questionnaire has good psychometric properties with Cronbach’s alpha = 0.92 and intraclass correlation coefficient = 0.81 (Houck, et al., 2002). In the current study, a score of 0-4 will count as no clinically relevant symptoms and 16 or higher as severe PD.

Anxiety symptoms in general will be measured with the Beck Anxiety Inventory (BAI; Beck, Epstein, Brown, & Steer, 1988). The BAI contains 21 short questions. Internal consistency is high, with Cronbach’s alpha ranging from .90 to .94 (Beck, et al., 1988). The score varies from 0 to 63. A score of 30 or higher is interpreted as severe anxiety symptoms.

Depressive symptoms will be measured with the CES-D (Radloff, 1977). The CES-D is a 20-item self-report questionnaire. Every item ranges from 0 to 3 and the total score ranges from 0 (no feelings of depression) to 60 (severe feelings of depression). Radloff (1977) reports high internal consistencies among different populations (.79 to .92). The optimal cut-off score varies between 16 and 27 (Haringsma, Engels, Beekman, & Spinhoven, 2004). In the current study, we will regard 27 and higher as a high score.

Suicidal risk and ideation will be measured with the specific section of the Mini-International Neuropsychiatric Interview (MINI; Lecrubier, et al., 1997; Sheehan, et al., 1998). The MINI suicide section consists of 6 items and classifies subjects into four groups: no suicidal risk, low suicidal risk, moderate suicidal risk, and high suicidal risk. In this study, the items are self-report. Participants with moderate to high suicidal risk will be excluded from this study.

Quality of life will be measured with the Dutch version of the EuroQol Questionnaire (EQ-5D; Brooks, 1996; De Beurs, den Hollanders-Gijsman, Buwalda, Trijsburg, & Zitman, 2005). This short list contains five dimensions: mobility, self-care, usual activities, pain/discomfort and anxiety/depression. The EQ-5D generates a total of 243 unique health states, each of which is associated with a utility score ranging from 0 (poor health) to 1 (perfect health). The EQ-5D is a validated instrument for measuring general health-related quality of life (Brooks, 1996; De Beurs, et al., 2005; Fransen & Edmonds, 1999).

Loss of production and health care consumption - An indication of loss of production and use of care will be made with the Trimbos and Institute of Medical
Technology Assessment Questionnaire on Costs Associated with Psychiatric Illness (TiC-P; Hakkaart-van Roijen, van Straten, Donker, & Tiemens, 2002). This list consists of three parts. Part I measures health care consumption of individuals who suffer from mental disorders. Part II examines loss of production (indirect costs) and part III general, demographic variables. In the current study, part III will be omitted, because demographic variables are already measured elsewhere.

Satisfaction and track-and-trace - A track-and-trace system will keep a record of the dates participants of the intervention group log on or finish a lesson. This system will also pose a question after each lesson: "Was this lesson useful to you?", which can be answered on a 5-point Likert scale. At T1, these participants will receive questions about their experience with the intervention. This includes the number of lessons followed, the amount of time spent on homework, satisfaction with the intervention and satisfaction with the coaching.

Analyses
Differences in demographic and baseline clinical characteristics will be computed with Chi-square tests, t-tests, and analysis of variance (ANOVA). The data of post-treatment measurements will be analysed in agreement with the intention to treat principle. Assuming missing data will be missing at random, the Linear Mixed Modeling (LMM) procedure will be used for all analyses to estimate missing values. LMM includes incomplete cases in the analysis and employs restricted maximum likelihood estimation to calculate parameter estimates.

Effects between the experimental and control group on continuous measures will be calculated with Cohen's $d$. Cohen's $d$ is computed by subtracting the mean post-test score of the control group from the average score of the experimental group and dividing the difference by the pooled standard deviation. Effect sizes of 0.8 can be assumed to be large, while effect sizes of 0.5 are moderate, and effect sizes of 0.2 are small (Cohen, 1988). Estimated data from the LMM procedure will be used to analyse effect sizes.

Discussion
Internet-based self-help for PD has proved to be effective. However, existing interventions focus on treating a full-blown disorder, while subclinical PD is highly prevalent and can develop into full-blown PD. This study is a randomised controlled trial aimed to evaluate an internet-based self-help intervention for subclinical and mild PD compared with a waiting list control group. The primary
outcome measure is the severity of panic and anxiety symptoms. Secondary outcome measures include depression, quality of life, loss of production and health care consumption.

Methodological considerations
The primary research question is whether DPO is an effective intervention for mild and subclinical PD. We hypothesise the experimental group will show more improvement on the outcome measures than the control group, because the experimental group receives an accessible intervention tailored for its specific mental health problems.

A limitation of this study is the low number of exclusion criteria. The presence of a comorbid disorder or substance abuse is not an exclusion criterion. Comorbidity may influence this study’s outcome measures, because panic symptoms may not be the participant's primary mental health problem. However, in reality, many people who suffer from panic symptoms have comorbid mental health problems, especially other anxiety disorders and depression (Kessler, et al., 2005). Therefore, it is preferable not to exclude participants based on DSM diagnoses for these disorders. An indication of the effects of comorbidity on the effectiveness of DPO could be obtained by mediator analyses.

Both a strength and a limitation of this study is that, besides the diagnostic interview, the measurements are conducted online. Some evidence suggests psychometric properties may change when a test is conducted via the web (Buchanan, et al., 2005; Cuijpers, Boluijt, & van Straten, 2008). Consequently, results of this study may differ from studies into panic interventions that applied paper-pencil questionnaires. On the other hand, the strength of online self-report measurements is the accessibility of participation (Whitehead, 2007). Therefore, this study is feasible and should be able to answer the research questions.

Conclusion
Existing online interventions for panic symptoms focus on treating full-blown PD, while subclinical PD is highly prevalent and may develop into a full-blown disorder. This study evaluates an internet-based self-help intervention for subclinical and mild PD. Results will contribute to the ongoing research into internet-based interventions and treatment for panic symptoms.

References


