Brief report

Internet administration of the Edinburgh Depression Scale

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Abstract

Background: Internet-based screening for depression is becoming increasingly important. The aim of this study is to validate the Edinburgh Depression Scale (EDS) for internet administration.

Methods: In 407 participants (64% women; 36% men) with subthreshold depression (mean age=55 years; S.D.=4.9) positive predictive values for a syndromal CIDI diagnosis of clinical depression were calculated and compared to those from paper and pencil validation studies.

At one-year follow-up, internal consistency and convergent validity of the internet-administered EDS were determined in 177 participants by Cronbach’s alpha and correlations with the internet-administered BDI and SCL-90 subscales depression and anxiety.

Results: Positive predictive values ranged between 29% and 33% at cut-off scores of 12 to 14. Cronbach’s alpha for the internet-administered EDS was 0.87. The EDS correlated significantly with the internet-administered BDI (r = .75; p < .001) and two internet-administered subscales of the SCL-90: depression (r = .77; p < .001) and anxiety (r = .72; p < .001). A major limitation is that the study was conducted without a control group of healthy subjects.

Conclusion: The psychometric properties of the internet-administered EDS are comparable to those of the paper and pencil EDS.

Keywords: Edinburgh Depression Scale; Psychometric properties; Internet administration; Positive predictive values; Reliability; Validity

1. Introduction

With the increasing popularity of internet-based treatments (Marks et al., 2007), internet-based screening for depression has become more important as well. As it is clear that, even in the most ideal situation, not all people with depression can be treated within the present capacity of face-to-face interventions (Andrews et al., 2004), internet-based self-help may provide part of a solution to this problem. Internet-based self-help has advantages over traditional therapies for both clients and health care. The low-threshold accessibility of the internet makes it very suitable for offering and receiving help for psychological problems. Clients who are treated on the internet can avoid the stigma incurred by seeing a therapist (Gega et al., 2004). They can obtain treatment at any time and place, work at their own pace, and review the material as often as desired. Furthermore, internet-based self-help has the advantage that if can be offered anonymously, the threshold for starting treatment will be lowered even more. However, clients have to be provided with guidance to help them find the intervention that would be appropriate for them. Internet-based questionnaires can play an important role in this process. In order to be able to provide people with valid advice, it is imperative to have knowledge about the psychometric properties of internet-administered questionnaires. With it’s high reliability, the...
Concise ten-item Edinburgh Depression Scale might be a very good internet-administered screening device for depression, although good psychometric properties of a paper and pencil version of a questionnaire do not guarantee good psychometric properties of an internet-administered version (Buchanan, 2003).

Therefore, the aim of this study is to validate the Edinburgh Depression Scale for internet use.

2. Methods

2.1. Participants and procedure

Participants with subthreshold depression were recruited as part of a large randomized controlled trial comparing internet-based cognitive behavior therapy, group cognitive behavior therapy and a waiting-list control group (Spek et al., 2007). Potential participants were informed about the study by advertisements in free regional newspapers, and by personal letters sent by the Municipal Health Care Service of the city of Eindhoven. The letters and advertisements provided information about the study and the address of the study homepage, which contained general information about depression, information about the study, and an application form including the Edinburgh Depression Scale (EDS; Cox et al., 1987; Cox et al., 1996; Matthey et al., 2001).

Participants who scored above the cut-off score of 12 on the internet-based EDS (n=699, screening data) were invited for an in-person structured clinical interview for depression (Composite International Diagnostic Interview; WHO, 1997). The participants were unaware of the cut-off score being used to select who would be invited for the interviews. During the interview, participants were informed about the study and the study conditions, demographic data were collected, and a structured interview was conducted to assess the DSM-IV criteria of depression. At the end of the clinical interview, eligible participants (those without a diagnosis of major depression, defined as subthreshold depression) were asked to participate in an intervention study, described in greater detail elsewhere (Spek et al., 2007). One year after the start of treatment, there was another assessment, which included the internet version of EDS and BDI (Fig. 1).

The study protocol was approved by the ethics committee of the Maxima Medisch Centrum Eindhoven.
(a local hospital in Eindhoven, The Netherlands); this committee is certified by the Central Committee on Research involving Human Subjects in The Netherlands.

2.2. Measures

2.2.1. The Edinburgh Depression Scale (EDS)

The EDS is a ten-item self-report scale (total scale range 0–30) assessing the common symptoms of depression. It was originally designed to assess post partum depression and was called the Edinburgh Postnatal Depression Scale (EPDS; Cox et al., 1987). The EPDS has later been validated in The Netherlands (Pop et al., 1992), in other age strata (Murray et al., 1990; Cox et al., 1996; Becht et al., 2001; Nyklíček et al., 2004) and in men (Matthey et al., 2001) and renamed the EDS. Internal consistency (Cronbach’s alpha) has been shown to be at least .80 (Cox et al., 1987; Matthey et al., 2001). The EDS was found to correlate .64 with the Beck Depression Inventory (Pop et al., 1992). With a clinical diagnosis of major depression as the criterion, the sensitivity, specificity, and positive predictive value (PPV) are good, respectively 81–88%, 80–96%, and 21%–43% at cut-off point of 12 (Murray et al., 1990; Cox et al., 1996; Becht et al., 2001; Nyklíček et al., 2004). In the internet-based version of the EDS, all ten items were presented on the same website. In order to be able to send the answers to the study database, the participants had to fill in all the items; it was not possible to skip items.

2.2.2. Composite International Diagnostic Interview (CIDI)

The World Health Organization CIDI (World Health Organization, 1997) is a fully structured interview developed to identify DSM-IV and ICD-10 symptoms, and to report whether the diagnostic criteria are met. Reliability of the CIDI for mood disorders is good: the test–retest kappa coefficient is .71 and the interrater kappa coefficient is .95 (Wittchen, 1994).

2.2.3. Beck Depression Inventory — second edition (BDI-II)

The BDI (Beck et al., 1996) is the most frequently used self-report measure for depressive symptoms. It contains 21 items. The BDI was developed to assess the intensity of depressive symptoms. Internal consistency is high, in the Dutch manual, Cronbach’s alphas of 0.92 and 0.93 are reported (Van der Does, 2002). The internet-administered BDI was found to correlate 0.94 with the paper and pencil BDI (Carlbring et al., 2007).

2.2.4. Symptom Checklist-90 (SCL-90)

The SCL-90 (Derogatis et al., 1973; Derogatis and Cleary, 1977) assesses psychopathology indicators. Of this checklist, only the depression and anxiety subscales were administered. The reliability and validity of these subscales are good (Arindell and Ettema, 1986).

2.3. Analyses

Statistical analyses were preformed using SPSS 14.0. The positive predictive values (percentages of high scorers on the EDS who received a diagnosis of depression according to the CIDI) were calculated on the screening data. To determine the internal consistency of the internet-administered EDS, Cronbach’s alpha was calculated with the one-year follow-up data. As the screening data only contained EDS scores equal or above 12, these were not suitable for reliability measures due to restriction of range (all scores ≥ 12). One year after the start of treatment, there was much more variety in scores; the natural range of scores was covered and therefore it was possible to reliably calculate Cronbach’s alpha. Moreover, the correlations between the internet-administered EDS and the internet-administered BDI and between the internet-administered EDS and the internet-administered SCL-90 subscales depression and anxiety were calculated.

3. Results

A total of 407 participants completed a clinical interview, including the CIDI. The mean screening internet EDS score was 17.58 (S.D. = 3.89). All interviewees scored ≥ 12 (range 12–29). For the 117 participants with a positive CIDI (diagnosis of major depression) the mean EDS score was 20.18 (S.D. = 3.55); for the 295 participants with a negative CIDI (no diagnosis of major depression, defined as subthreshold depression) the mean EDS score was 16.48 (S.D. = 3.45).

Table 1

<table>
<thead>
<tr>
<th>EDS score</th>
<th>PPV internet-administered EDS</th>
<th>PPV paper and pencil EDS</th>
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<tbody>
<tr>
<td>12</td>
<td>29%</td>
<td>21–43%</td>
</tr>
<tr>
<td>13</td>
<td>31%</td>
<td>24–50%</td>
</tr>
<tr>
<td>14</td>
<td>33%</td>
<td>28–58%</td>
</tr>
</tbody>
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be found in Table 1 and varied between 29 and 33% according to different cut-off scores. These were compared with different PPV of paper and pencil EDS (Table 1). One-year follow-up measures were completed by 177 participants. The completers did not differ from non-completers regarding age, gender, having a partner, educational level, employment status, assigned condition, EDS scores at screening, and BDI baseline scores (data not shown). For the EDS 1 year after the start of treatment (N=177; mean=8.91; S.D.=5.34; range 0–28) we found a Cronbach’s alpha of .87. The internet-administered EDS correlated significantly with the internet-administered BDI (r=.75; p<.001). Furthermore, the internet-administered EDS also correlated significantly with the internet-administered subscales of the SCL-90: depression (r=.77; p<.001), and anxiety (r=.72; p<.001) at follow-up.

4. Discussion

In this study, the validity of the internet-administered Edinburgh Depression Scale was assessed in two samples. The positive predictive values were comparable to those found in previous paper and pencil studies (Murray et al., 1990; Cox et al., 1996; Becht et al., 2001; Nyklíček et al., 2004; Table 1). We found that the internet-administered EDS has good internal consistency: comparable to that of the paper and pencil EDS. We found a high correlation of the internet-administered EDS with the internet-administered BDI, which has been validated for internet administration in an earlier study (Carlbring et al., 2007). Our correlation is similar to the correlation of paper and pencil EDS and BDI (Pop et al., 1992). Furthermore, we found high correlations with SCL-90 subscales depression and anxiety. These results are comparable to those found in a study of the paper and pencil EDS and the paper and pencil SCL-90 (Pop et al., 1992).

This study has several limitations. As we only interviewed participants with a score of 12 or more on the EDS, we were unable to calculate the sensitivity and the specificity of an internet-administered EDS. Second, the study was conducted without a control group of healthy subjects. Furthermore, all participants in this study were over 50 years old. Therefore, our results might not be completely generalizable to the general population. Fourth, we did not obtain our own paper and pencil data. However, in an early study, a correlation of .98 was found for paper and pencil and computerized EDS scores (Glaze and Cox, 1991). This suggests that data from paper and pencil administration and computerized administration are identical.

Despite the limitations, the current study shows that an internet-administered EDS has good psychometric properties. This suggests that the internet-administered EDS can be used in practice.

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Conflict of interest

There are no conflicts of interest.

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References


