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DOES PROBLEM SOLVING ABILITY PREDICT THERAPY OUTCOME IN A CLINICAL SETTING?

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Abstract. This study tested the use of a problem solving measure (The Problem Solving Scale: Center for Cognitive Therapy, 1988) as a predictor of outcome in patients receiving cognitive behaviour therapy (CBT) in an NHS psychotherapy service. Lower scores at assessment on the Problem Solving Scale (PSS) were predicted to be associated with poorer outcome for all diagnoses (but particularly depression) and higher dropout. The PSS predicted outcome for depressed patients receiving CBT, but not anxious patients or patients with other disorders. Poorer problem solving was not associated with dropout from therapy. Components of the scale that were most closely correlated with global outcome seemed to reflect the behavioural activation and cognitive restructuring skills taught in CBT for depression. Since this is the second study to connect PSS scores with outcome in depression (Scott, Harrington, House, & Ferrier, 1996), the possibility that aspects of learned resourcefulness are relevant to patients' suitability for CBT remains alive, and further research in this area is indicated.

Keywords. Cognitive behaviour therapy, prediction of outcome, problem solving, depression, learned resourcefulness.

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Introduction

Background

Predicting which psychotherapy will work for whom is notoriously difficult, yet clinical experience confirms that some patients respond better to certain forms of therapy than others. In clinical practice we often judge a person's suitability for cognitive behaviour therapy by their response to the therapy's rationale and their capacity to think in terms of the cognitive model (Moorey, 1996). There is some empirical evidence in support of this assumption. In an early paper on cognitive therapy for depression, Fennell and Teasdale (1987) reported that patients who had a positive response to the cognitive model when it was explained to them and then went on to have a successful homework assignment recovered from depression more quickly. Safran and Segal's interview rating of suitability for standard cognitive therapy, which among other things assesses the capacity to recognize thoughts and feelings, and to accept the cognitive model, has been shown to predict outcome of CBT (Safran & Segal, 1992). Some years ago, there was interest in the possibility that people who were already skilled in ''learned resourcefulness'' might be the patients who did best in CBT. Learned resourcefulness (Rosenbaum, 1980) is in a sense the opposite of learned helplessness (Seligman, 1975). It describes a set of coping behaviours connected with problem solving, emotional self-regulation and self-efficacy. Simons (Simons, Lustman, Werzel, & Murphy, 1985) found that high scorers on the Self Control Schedule (Rosenbaum's measure of learned resourcefulness; Rosenbaum, 1980) showed a better response to cognitive therapy for depression as measured by the Beck Depression Inventory, while low scorers on this scale responded better to a tricyclic antidepressant. Rehm, Kaslow and Rabin (1987) reported that subjects with initial high scores on the Self Control Schedule (SCS) improved the most over a course of self-control therapy for depression, while Burns, Rude, Simons, Bates, and Thase (1994) found that high scores on the Self Control Schedule (SCS) predicted outcome of cognitive therapy for depression at 12 weeks. Other studies, however, were not able to replicate these findings (Hoberman, Lewinsohn, & Tilson, 1988; Jarrett, Giles, Gullion, & Rush, 1991; Kavanagh & Wilson, 1989; Rude, 1986; Wetzel, Murphy, Carney, & Whitworth, 1992). The Self Control Schedule is a self-rating scale that measures four categories of self-control behaviours: (a) use of cognition and self-statements to control emotional and physiological responses; (b) the application of problem solving strategies (e.g. planning, problem definition, evaluating alternatives, anticipation of consequences); (c) the ability to delay immediate gratification; and (d) perceived efficacy (Rosenbaum, 1980). Scott suggested that the problem solving component of this scale (The Problem Solving Scale; Center for Cognitive Therapy, 1988) might be the variable associated with positive outcome in those studies that found an association between the SCS and response to CBT. Scott, Harrington, House and Ferrier (1996) followed up 20 patients with major depressive disorder and found that the Problem Solving Scale predicted both recovery status and symptom severity at 3 months and 6 months. Moorey, Hughes, Knynenberg and Michael (2000) have presented some further work on the Problem Solving Scale (PSS), and demonstrated that the instrument has good internal reliability. Furthermore, the instrument does not correlate with measures of anxiety or depression, which suggests that it measures a problem solving ability that is independent of mood state. This could make it a useful predictive tool for CBT outcome.

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Aims of the study

The study presented here was an attempt to evaluate the Problem Solving Scale's power to predict CBT outcome in a naturalistic setting i.e. a busy NHS psychotherapy department where a variety of disorders are treated by a heterogeneous group of therapists. A brief, pencil and paper test that might help select patients who would benefit most from CBT could be invaluable in this context. Previous studies had usually been carried out in research centres and they had also focused on *depressed* patients but not patients with other disorders. There is no reason a priori to assume that good problem solving ability might be associated with good response to CBT in depression but not in other disorders. In fact, the association between *worry* and problem solving deficits has led some researchers in the field to suggest that problem solving training should be a major component of treatment for generalized anxiety disorder (Tallis, Eysenck, & Mathews, 1991; Metzeger, Miller, Cohen, Sofka, & Borkovec, 1990; Dugas, Letarte, Rheaume, Freeston, & Ladouceur, 1995). This gives added weight to the proposal to apply the PSS to disorders other than depression. The City and Hackney Psychotherapy Department is an inner city psychological treatment service that offers a range of therapies, including individual and group psychodynamic therapy, counselling, cognitive and behaviour therapy and cognitive analytic therapy. The cognitive behavioural section of the department at the time of the study consisted of a consultant psychiatrist in CBT (SM), two part time clinical psychologists and two nurse behavioural psychotherapists. The CBT service receives 350 referrals per year across a spectrum of diagnoses. The commonest problems are chronic depression, anxiety disorders and interpersonal problems. We set out to assess a sample of patients in everyday practice in as systematic a manner as possible given the constraints of the service. One-hundred-and-fifty-three patients were assessed for psychological treatment by the first author over a 2-year period. Details of this sample are given in a paper describing the psychometric properties of the PSS (Moorey et al., 2000). The present study follows up the patients from this original sample who were allocated to cognitive and behaviour therapies (here designated cognitive behaviour therapy). The study sought to test three hypotheses:

Hypothesis 1: High scores on the Problem Solving Scale at assessment will be associated with better outcome in Cognitive Behaviour Therapy for the sample as a whole (i.e. all diagnoses).

Hypothesis 2: High scores on the Problem Solving Scale at assessment will be associated with better outcome in Cognitive Behaviour Therapy for depressed patients.

Hypothesis 3: High scores on the Problem Solving Scale at assessment will be associated with a lower dropout rate from Cognitive Behaviour Therapy.

Method

Subjects

The original data set of patients consisted of consecutive referrals to the City and Hackney Cognitive Therapy Service who were assessed by SM. Complete assessment data were available from 153 (approx. 80%) of patients assessed. Details of this sample are reported in an earlier paper (Moorey et al., 2000). Of these, 95 were allocated to Cognitive Behavi-

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oural Therapy. Data on 30 patients were not accessible (due to reasons explained under procedures), so that the resulting sample consisted of 65 (70.5% of the original data set). The patients allocated to CBT and entering the data analyses did not differ in their socio-demographic characteristics (sex, age, marital status and ethnicity) from those patients who were allocated to CBT and did not enter the analyses. The mean age of the sample was 36 (*SD* 10.5). Forty-eight percent were women. The majority was single (60%). Nineteen percent of patients were married, 10% co-habiting and 10% divorced or separated. The sample was predominantly white (76%) and of relatively high educational attainment (31% had obtained a degree) despite the inner city area served.

The most frequent diagnosis among the 65 patients studied was depression (21 patients). Anxiety disorders were the next most common (agoraphobia 6, panic disorder without agoraphobia 7, social phobia 6, obsessive-compulsive disorder 6, generalized anxiety disorder 4, and post traumatic stress disorder 3).

Measures

The Problem Solving Scale (Centre for Cognitive Therapy, 1988) is a shortened version of the Self Control Schedule (Rosenbaum, 1980). The scale contains items 1, 2, 7, 10, 11, 12, 20, 22, 26, 27, 28, 30, 32, 33 and 34 of the Self Control Schedule. It is specifically designed to measure the application of self control methods to the solution of behavioural problems. There is evidence of good internal reliability of the instrument (Moorey et al., 2000).

The Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) is a widely used measure of the severity of depression. It is a 21-item self-report measure with good evidence of reliability and validity (Beck, Steer, & Garbin, 1988).

The Beck Anxiety Inventory (BAI; Beck, Brown, Epstein, & Steer, 1988) is a more recently developed measure of symptoms of anxiety. It is a 21-item self-report measure with high internal consistency and concurrent validity.

Presenting problems

Nineteen key presenting symptoms were assessed: anxiety, panic, agoraphobia, social anxiety, obsessive-compulsive symptoms, depression, bulimia, anorexia, substance misuse, low self-esteem, anger control problems, marital problems, pervasive interpersonal problems, self-harm, adjustment disorder, health anxiety, post traumatic stress symptoms, somatic symptoms or other problems.

Therapy outcome

As part of the clinical service, each therapist completed a global measure of outcome at the end of treatment. This was a simple 5-point scale: worse, no change, slightly improved, moderately improved, very much improved. Because therapy outcome data were incomplete, an independent rater (CH), who had not been involved in the assessment or therapy process, reviewed case materials from all patients assigned to CBT. The 5-point scale was completed

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as a global measure of change using information from any objective measures, session notes and discharge summaries.

Procedure

All patients had been assessed for cognitive behaviour by SM. This consisted of a brief psychiatric interview and a problem oriented assessment for cognitive therapy. The presence or absence of the 19 presenting problems/symptoms was noted at assessment. The assessment reports for all the patients were reviewed by SM and patients allocated to one of three diagnoses (depression, anxiety, and other) on the basis of the presenting symptoms. Although there was overlap between these groups in terms of their symptomatology (there were no significant differences between the three groups on BDI or BAI scores), the separation was made on the basis of which of the problems was considered to be primary. These diagnostic groups were chosen to give a reasonably comparable number of patients in each category for the purposes of analysis. Following the assessment interview, patients were given the Beck Depression Inventory, Beck Anxiety Inventory and Problem Solving Scale. Patients allocated to cognitive behavioural therapy were then placed on a waiting list and taken on for therapy by the first suitable and available therapist. The mean waiting time between assessment and start of therapy was 6 months (*SD* 3.5 months). Twenty-seven therapists treated the patients in the study (10 psychiatrists, 12 nurses, 4 psychologists, and 1 counsellor). Five therapists were fully trained in CBT. The remaining 22 were in training, approximately half treating their first case under supervision.

Information on the therapies was obtained retrospectively from the patient files by CH as described above. Ending of therapy, outcome of therapy assessments and the number of sessions could often be taken from therapy sheets, which therapists were expected to fill in and which explicitly asked for the information. In case therapists had not filled in the sheets, information was obtained from discharge letters or similar sources of information within the files. Because patients who were allocated to CBT were taken on by a number of different therapists, many of whom did not work in the Psychotherapy Department, some had not sent the patient files back to the Hospital at the time the data were collected, thus accounting for the missing data.

Results

Therapy outcome

Twenty percent of patients made a marked improvement as a result of therapy, 46% were moderately improved and 21% slight improved. Thirteen percent were judged not to have improved, but no patients were made worse by therapy. Whether patients were seen by trained therapists or therapists in training did not have any statistically significant effect on outcome, dropout rates or length of therapy.

Hypothesis 1: PSS scores predict outcome in all patients

Pearson correlations between PSS scores at assessment and Therapy Outcome were –0.05 ($p = .74$, $n = 36$) for patients treated with CBT. As another way of investigating a possible

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Table 1. Scores at assessment on Problems Solving Scale, Beck Depression Inventory and Beck Anxiety Inventory

Measure	Mean	Standard Deviation	Range
Problem Solving Scale (Possible range –45 to +45)	6.0	15.5	–30 to +36
Beck Depression Inventory (Possible range 0 to 63)	20.5	10.9	0 to 57
Beck Anxiety Inventory (Possible range 0 to 63)	20.3	20.3	0 to 48

association, patients were divided into two groups on the basis of their Therapy Outcome scores. Patients who were moderately improved or very much improved were deemed to have a good outcome, while patients with no change or slight improvement were designated as poor outcome. Using *t*-tests there were no significant differences between PSS scores at assessment in patients who later showed a good or poor outcome.

Hypothesis 2: PSS scores predict outcome in depressed patients

The sample was next subdivided into patients with significant depressive symptomatology. There was a difference between the mean PSS scores in patients who had been diagnosed as depressed at assessment. The mean PSS for CBT patients with a good outcome was 14.4 (*SD* 12.8, $n = 7$) while that for patients with poor outcome was –3.0 (*SD* 14.3, $n = 7$). This difference was statistically significant ($t = 2.4$, $p = .03$). There was a correlation between the PSS and therapy outcome (0.53, $p = .05$, $n = 14$).). This association remained, but was not statistically significant, when the duration of symptoms prior to assessment was partialled out (0.53, $p = .07$, $n = 11$). Because of concern about the validity of this diagnostic grouping, independent raters reviewed the assessment reports and made a clinical diagnosis for the patients. Patients diagnosed as depressed by this method showed a correlation between PSS score and therapy outcome (0.52, $p = .08$, $n = 12$). Patients diagnosed as suffering from anxiety disorder did not show an association between the PSS score and outcome (Pearson correlation coefficient –0.25, $p = .48$, $n = 10$). Within the different subgroups there was no effect of the presence of a personality disorder or marked problems with interpersonal relationships on PSS scores.

Hypothesis 3: PSS scores predict dropout rates

Of the 65 patients for whom data were available, 17 (26%) did not start therapy, either because they no longer wanted treatment, or simply did not attend. Five patients (8%) dropped out before session 5, 4 (7%) between sessions 5 and 10, and 39 (59%) completed therapy. A one-way analysis of variance was performed comparing the PSS scores of patients who did not start therapy, dropped out of therapy, or completed therapy. No significant effects were found for the whole sample or the depressed patients.

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Table 2. Pearson correlations between Problem Solving Scale and Therapy Outcome

	Sample		
Therapy	Depressed patients	Anxious patients	Whole sample
CBT	0.53 (n=14, p=.05)	–0.25 (n=10, p=.48)	–0.05 (n=36, p=.74)

Table 3. Pearson correlations between PSS factor derived subscales and Therapy Outcome

	Sample	
Factor	Depressed patients	Anxious patients
1. Task management	0.47 (p=.09, n=14)	–0.15 (p=.66, n=11)
2. Consideration	0.16 (p=.58, n=15)	–0.37 (p=.26, n=11)
3. Stress management	0.76 (p=.001, n=15)	0.41 (p=.24, n=10)
4. Self-control	0.33 (p=.24, n=15)	–0.22 (p=.56, n=10)

Discussion

Hypothesis 1

This study set out to assess the usefulness of the PSS as a tool for predicting response to CBT in general. As such, we applied it at the assessment of a heterogeneous sample of therapy patients in the hope that high scores on the PSS would correlate with therapy outcome. This did not prove to be the case. There were no significant relationships between PSS and outcome. Although there are limitations to what conclusions can be drawn from this study (see below), there is no evidence to suggest the PSS can be used as a measure of suitability for CBT across the board.

Hypothesis 2

There does seem to be evidence that problem solving ability as measured by the PSS is associated with good outcome in CBT for depression. Although the sample size was small, the PSS was strongly correlated with therapy outcome. There is therefore some preliminary evidence to support the findings of Simons (1985), Rehm (1987) and Burns (1994) that self-control capacity may be associated with better outcome in CBT. There is also more specifically support for the idea that problem solving ability may be the mediating factor in this association (Scott et al., 1996; Moorey et al., 2000). This is in contrast to the finding for anxiety where the correlation is negative (–0.25) but not statistically significant. This is somewhat puzzling, given the connection between problem solving and anxiety described by some authors. Problem solving deficits have been connected to worry and generalized

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anxiety disorder (Tallis et al., 1991; Metzger et al., 1990; Dugas et al., 1995), post traumatic stress disorder (Nezu & Carnevale, 1987) and agoraphobia (Brodbeck & Michelson, 1987). To investigate this further, we looked at the correlations between outcome and subscales of the PSS derived from a factor analysis of the original sample of 153 patients (Moorey et al., 2000). It seems that two subscales contribute to the correlation between PSS and CBT outcome in depression: ''task management'' and ''stress management''. Task management contains items such as ''I usually plan my work when faced with a number of things to do.'' And ''If I find it difficult to concentrate on a certain job, I divide the job into smaller segments.'' Stress management contains items such as ''When I realise that I cannot help myself but be late for an important meeting, I tell myself to keep calm.'' And ''When I have to do something that is anxiety arousing for me, I try to visualize how I will overcome my anxieties while doing it.'' These correspond to some of the behavioural and cognitive techniques used in CBT for depression. In the anxious patients in this sample, the stress management factor correlated highest with outcome and the other factors were negatively correlated (no correlations reached statistical significance). The PSS may therefore tap into the behavioural activation strategies and cognitive self-regulation strategies used in CBT for depression, and this may explain its overall correlation with outcome in depression but not anxiety.

Hypothesis 3

The original assumption was that patients who took more readily to CBT would be less likely to drop out. Individuals who already thought in a problem solving way might find it easier to engage in and stay with the CBT model. This hypothesis was not supported by the data. No relationship was found between PSS score and dropout. However, we did not have very much information on the reasons for dropout and the level of improvement, or lack of it, as the time the patients terminated therapy was not always recorded. It is possible that there is a more complex relationship between dropout and outcome; there might be a bimodal distribution in which patients either dropped out because they were doing well and improved sufficiently or because they were not making progress.

Limitations of the study

The results of this study must be viewed with some caution. This is the first study to examine the correlation between problem solving and outcome in a mixed diagnostic group treated in a clinical setting. The sample shows symptoms in the moderate to severe range for anxiety and depression and the outcome data confirm that even though the patient group is heterogeneous and the therapists' experience varied greatly, significant improvement can be produced. No patients are made worse by their experience of therapy and between 66% of patients are moderately to very much improved. The way in which outcome is calculated is a rather crude global measure. This was necessary because of the variety of problems treated in the therapies and the difficulties in this setting of obtaining consistent pre and post therapy questionnaire scores. Other studies have used standardized self-rating scales.

A second confounding factor is the long waiting period. It may be that patients who score high on problem solving will be more likely to recover in the time between assessment and start of therapy, and therefore the interaction between problem solving and CBT is spurious.

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Although this cannot be ruled out as an explanation, there are three pieces of evidence against this. Firstly, the clinical impression was that patients still had significant problems when they began therapy, and would not have been offered treatment if they had recovered. In the depressed group (where the possible effect was found) most patients had been referred because of longstanding dysthymia or unresolved depression. If an untreated depression was referred to the service, the policy was to recommend a psychiatric referral initially because of the length of waiting time. Secondly, the PSS scores of patients who no longer wished to take up therapy or did not attend were not significantly different from those who attended. This goes some way to discounting spontaneous remission in good problem solvers. Finally, the global outcome scores were based on the degree of change over the course of therapy, not between assessment and end of therapy.

Perhaps the most important limitation of this study is the small sample size. This again is the result of attempting research in a clinical NHS setting. The original sample of 153 was large enough for the purpose of finding correlations between the PSS and outcome measures. At each stage of the clinical process there was attrition. Of the 95 patients allocated to CBT, 30 were lost because insufficient details were available in the notes (or notes were unavailable) to make a judgement about outcome! A relatively high number of patients then failed to attend for their start of therapy appointment (28%). This may have been a result of some patients having to wait several months for treatment, but it may also reflect the transient nature of the inner city population. Once in therapy, 81% of patients did complete treatment. Once the sample is subdivided into groups on the basis of mood disorder, the number of patients available for analysis means that only correlations above 0.5 are likely to be statistically significant. Studies of this kind in NHS practice are needed, but in order to acquire a sufficient sample size they probably need to be collaborative enterprises involving two or three psychological therapies units.

Conclusions

Certain problem solving skills, as measured by the Problem Solving Scale, seem to be predictive of outcome of CBT for depression. This does not seem to be the case with CBT for anxiety or other disorders. There is a suggestion that the components of the PSS that are most closely correlated with global outcome reflect the behavioural activation and cognitive restructuring skills taught in CBT for depression. This is the second study to provide evidence that the PSS may predict outcome in depression (Scott et al., 1996) The possibility that aspects of learned resourcefulness are relevant to patients' suitability for CBT remains alive, and a larger study with more rigorous methodology now needs to be carried out.

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