ELSEVIER

Journal of Affective Disorders 92 (2006) 287–290

JOURNAL OF AFFECTIVE DISORDERS

www.elsevier.com/locate/jad

Brief report

Psychiatrist effects in the psychopharmacological treatment of depression

Kevin M. McKay *, Zac E. Imel, Bruce E. Wampold

University of Wisconsin, Madison, United States

Received 12 August 2005; received in revised form 9 January 2006; accepted 16 January 2006
Available online 28 February 2006

Abstract

Background: The National Institutes of Mental Health's (NIMH) 1985 Treatment of Depression Collaborative Research Program (TDCRP) reported that imipramine hydrochloride with clinical management (IMI-CM) was significantly more beneficial than placebo with clinical management (PLA-CM) for individuals undergoing treatment for depression. Unfortunately, in analyzing the NIMH TDCRP data, researchers ignored the potential effect that psychiatrists have on patient outcomes, thereby assuming that psychiatrists are equally effective. However, this assumption has yet to be supported empirically. Therefore, the purpose of the current study is to examine psychiatrist effects in the NIMH TDCRP study and to compare the variation among psychiatrists to the variation between treatments.

Method: Data from 112 patients [IMI-CM (n=57, 9 psychiatrists); PLA-CM (n=55, 9 psychiatrists)] from the NIMH TDCRP study were reanalyzed using a multi-level model.

Results: The proportion of variance in the BDI scores due to medication was 3.4% (p<.05), while the proportion of variance in BDI scores due to psychiatrists was 9.1% (p<.05). The proportion of variance in the HAM-D scores due to medication was 5.9% (p<.05), while the proportion of variance in HAM-D scores due to psychiatrist was 6.7% (p=.053). Therefore, the psychiatrist effects were greater than the treatment effects.

Conclusions: In this study, both psychiatrists and treatments contributed to outcomes in the treatment of depression. However, given that psychiatrists were responsible for more of the variance in outcomes it can be concluded that effective treatment psychiatrists can, in fact, augment the effects of the active ingredients of anti-depressant medication as well as placebo.

Keywords: Psychopharmacology; Anti-depressants; Therapist effects; Depression

In 1985 the National Institute of Mental Health (NIMH) (Rockville, MD) commissioned the Treatment of Depression Collaborative Research Program (TDCRP). The dual aim of the TDCRP was to test the feasibility and value of the collaborative clinical trial model in psychotherapy research and to examine the effectiveness of two forms of psychotherapy — cognitive behavioral therapy (CBT) and interpersonal psychotherapy (IPT). These psychotherapies were further compared to both a "reference treatment condition" for which efficacy had already been established, in this case, imipramine hydrochloride with clinical management (IMI-CM) and placebo with clinical management condition (PLA-CM). In this study, IMI-CM was found to be superior to PLA-CM (Elkin et al., 1985, 1989, 1995; Elkin, 1999).

With some exceptions (i.e. Kim et al., in press), the analyses employed in the NIMH TDCRP studies have traditionally not considered the role that treatment providers play in patients' improvement (Elkin et al., 1985,

* Corresponding author. Tel.: +1 608 263 2829.
E-mail address: kmmckay@wisc.edu (K.M. McKay).

0165-0327/$ - see front matter © 2006 Elsevier B.V. All rights reserved.
doi:10.1016/j.jad.2006.01.020

1989, 1995; Elkin, 1999). This oversight raises a number of issues. First, ignoring psychiatrists assumes that they were equally as effective in working with patients. However, research drawn from the psychotherapy literature suggests that this may not be the case. Specifically, studies that have examined the role of the therapist have suggested that a large proportion of variance in outcomes (approximately 8%; Wampold, 2001) may be due to differences among therapists (e.g. Kim et al., in press; Crits-Christoph et al., 1991; Luborsky et al., 1997; Project MATCH Research Group, 1998; Blatt et al., 1996). A second problem with ignoring the role that psychiatrists played in patients' improvement is that if treatment outcomes vary among psychiatrists, then observations within psychiatrists are not independent. If observations within psychiatrists are not independent, then the probability of detecting differences among treatments and the effect sizes attributed to treatment differences are artificially inflated (Kim et al., in press; Barcikowski, 1981; Crits-Christoph and Mintz, 1991; Kenny and Judd, 1989; Kirk, 1995; Walsh, 1947; Wampold and Serlin, 2000).

It may well be that psychiatrist effects account for a significant proportion of the variance in outcomes in psychopharmacological treatment as well as in psychotherapeutic treatments. Indeed, psychiatry texts regularly suggest that health care providers' ability to establish a strong relationship with their patients may have an effect on treatment outcome. One such text warns that "Physicians' failure to establish good rapport with patients accounts for much of the ineffectiveness of care" (Sadock and Sadock, 2004, p. 6). Recognizing the possibility of variation among psychiatrists as a potential confound, Elkin et al. (1985) attempted to standardize the treatment offered by each psychiatrist through selection, training and fixed dosing schedules. However, Elkin et al. noted that psychiatrists received significantly less training than psychotherapists under the assumption that there was less variability among their treatment provision. Still, the assumption that the psychiatrists providing psychopharmacological treatment are not a salient factor in outcomes has not been tested. Accordingly, the purpose of the current study is estimate psychiatrist effects in the NIMH TDCRP psychopharmacology conditions (IMI-CM and PLA-CM) and to compare the variation among psychiatrists to the variation between treatments.

1. Method

1.1. Study design

Previous studies have given thorough descriptions of the procedures for the NIMH TDCRP study (Elkin et al., 1985). In order to be included in the NIMH TDCRP study patients had to be non-bipolar, non-psychotic outpatients and meet a variety of research diagnostic criteria. In the current analysis, the outcomes of 112 patients assigned to either IMI-CM ($n=57$, 9 psychiatrists) or PLA-CM ($n=55$, 9 psychiatrists) were examined.

The Hamilton Rating Scale for Depression (HAM-D), the Beck Depression Inventory (BDI), the Hopkins Symptom Checklist-90 (HSCL-90), and the Global Assessment Scale (GAS) were used to assess patient status pretreatment, during treatment, and at termination (Elkin et al., 1985). However, since depression was the construct of interest in the current analysis results are reported for the BDI and the HAM-D only.

1.2. Statistical analyses

Given that participants in the current study were "nested" within psychiatrists, hierarchical linear modeling (HLM) is the analysis of choice (Snijders and Bosker, 1999; Raudenbush and Bryk, 2002). Using HLM 6.0 for windows (Raudenbush et al., 2004) HLM will be applied to make the appropriate estimates of treatment effects and psychiatrist effects. For preliminary analysis we will use an alpha level of .05 per analysis. For the primary analysis, psychiatrists from the NIMH TDCRP medication trials were treated as a random factor in order to be able to generalize to a population of psychiatrists (Wampold and Serlin, 2000). For the secondary analysis, both psychiatrists and treatments were entered as random factors in order to determine whether or not psychiatrist and treatment effects are independent.

1.3. Overall comparison of treatment effects to psychiatrist effects

In the primary analysis outcomes were modeled by entering treatment (PLA-CM v. IMI-CM) as a fixed factor and the psychiatrists as a random factor. In addition, pretreatment symptom severity for each variable was entered into the model in order to control for the initial status of each patient. This resulted in a multi-level model with two levels; the patient level (often referred to as level-1) and the psychiatrist level (often referred to as level-2; Snijders and Bosker, 1999; Raudenbush and Bryk, 2002). For example, in the case of the BDI, the model appeared as follows:

$$\mathrm{BDI}_{\mathrm{POST}} = \beta_0 + \beta_1(\mathrm{Treatment}) + \beta_2(\mathrm{BDI}_{\mathrm{PRE}}) + r, \quad (1)$$

where $\beta_0=\gamma_{00}+u_0$, $\beta_1=\gamma_{10}$, and $\beta_2=\gamma_{20}$.

In order to determine the proportion of variance due to psychiatrist the intraclass correlation (ρ_I) was examined (Wampold and Serlin, 2000). In the current analysis, the intra-class correlation is defined as the ratio of variance due to psychiatrist (τ_0^2) to the total variance ($\tau_0^2+\sigma^2$); this is

$$\rho_I = \tau_0^2/(\tau_0^2 + \sigma^2)$$

In order to determine the proportion of variance due to treatment (PLA v. IMI) Snijders and Bosker's (1999) method for estimating R_1^2 was followed. In the Snijders and Bosker method, the proportion of variance due to treatment is calculated by comparing the baseline model (b) (i.e., the model that does not include the predictor of interest) and fitted model (f) (i.e., the model that does include the predictor of interest) in the following way:

$$R_1^2 = \{[\tau_0^2(\mathrm{b}) + \sigma^2(\mathrm{b})] - [\tau_0^2(\mathrm{f}) + \sigma^2(\mathrm{f})]\} / [\tau_0^2(\mathrm{b}) + \sigma^2(\mathrm{b})]$$

A comparison of the estimates for ρ_I and R_1^2 provides an assessment of the relative importance of psychiatrists and treatments in the current study.

1.4. Independence v. non-independence of psychiatrist and treatment effects

In the secondary analysis outcomes were modeled by entering both treatment (PLA-CM v. IMI-CM) and psychiatrists as random factors. Once again, pretreatment symptom severity for each variable was entered into the model in order to control for the initial status of each patient. This resulted in a second multi-level model with two levels; the patient level (often referred to as level-1) and the psychiatrist level (often referred to as level-2; Snijders and Bosker, 1999; Raudenbush and Bryk, 2002), resulting in a similar model to that in Eq. (1).

Examination of the significance of the error term of the level-1 predictor "Treatment" (i.e. u_1) will assess whether or not psychiatrist and treatment effects are independent.

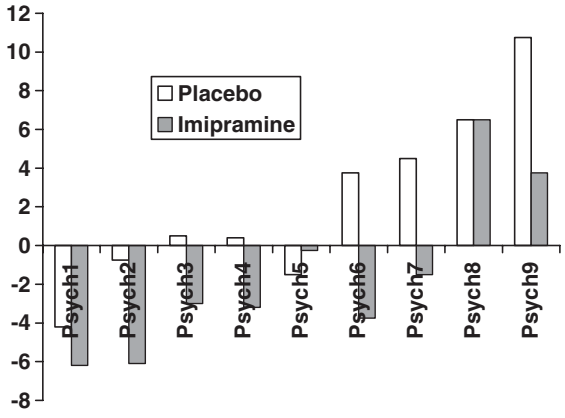

Fig. 1. BDI residual gain score as a function of type of treatment (PLA-CM v. IMI-CM) for each psychiatrist (1–9). Note that lower scores indicate better outcomes; negative residualized gain scores indicate better than average outcomes.

2. Results

The proportion of variability due psychiatrists (ρ_I) was equal to .091 for the BDI, which was significantly larger than zero ($p<.05$), and .067 for the HAM-D, which was marginally significant ($p=.053$). Further, the proportion of variance due to treatment (R_1^2) was .034 and .059 for the BDI and HAM-D, respectively; in both cases treatment effects were significantly greater than zero ($p<.05$). Thus, the psychiatrist effects were as great or greater than the treatment effects. Moreover, these effects were independent as evidenced by non-significant u_1s for both the BDI and HAM-D (in each case $p>.5$). The variation among psychiatrists and between treatments for the BDI is illustrated in Fig. 1 by graphing residualized gain scores (nb., negative scores indicate above average outcomes).

3. Discussion

Multilevel analyses of the NIMH TDCRP data revealed relatively large psychiatrist effects; 7% to 9% of the variability in outcomes was due to the psychiatrist providing the treatment. Still, when psychiatrist effects were modeled, treatment effects remained. That is, the superiority of imipramine hydrochloride to placebo that was detected in previous studies was not due entirely to variation among psychiatrists. Nevertheless, as can be seen in Fig. 1, the proportion of variability in outcomes was due less to the treatment received than to the psychiatrist administering the treatment. While psychiatrist effects should not be ignored as they are at least as large, and probably larger, than medication effects, it is important to note that psychiatrist effects were not as dramatic for the observer-rated measure (i.e. the HAM-D) as they were for the self-report measure (i.e. the BDI). These findings suggest that the magnitude of difference between psychiatrist effects and medication effects may not be as great as one would determine by examining the BDI alone.

Closer inspection reveals that one-third of the psychiatrists demonstrated superior outcomes with placebo than one-third of the psychiatrists demonstrated with imipramine hydrochloride. Further, this effect is additive in

that psychiatrists whose patients tended to improve on imipramine hydrochloride were the same psychiatrists whose patients tended to improve on placebo. It appears that the effective psychiatrists augment the effects of the active ingredients of imipramine hydrochloride as well as produce benefits with a placebo. Therefore, it may be that the most effective psychiatrists augment the neurochemical effects of the drug. Based on these findings it can be concluded that the *person* of the psychiatrist makes a difference in the response to anti-depressant medication. Therefore, the health care community would be wise to consider the psychiatrist not only as a *provider* of treatment, but also as a *means* of treatment.

References

Barcikowski, R.S., 1981. Statistical power with group means as the unit of analysis. Journal of Educational Statistics 6, 267–285.

Blatt, S.J., Sanislow, C.A., Zuroff, D.C., Pilkonis, P.A., 1996. Characteristics of effective therapists: further analysis of data from the National Institute of Mental Health treatment of depression collaborative research program. Journal of Consulting and Clinical Psychology 64, 1276–1284.

Crits-Christoph, P., Mintz, J., 1991. Implications of therapist effects for the design and analysis of comparative studies of psychotherapies. Journal of Consulting and Clinical Psychology 59, 20–26.

Crits-Christoph, P., Baranackie, K., Kurcias, J.S., Carroll, K., Luborsky, L., McLellan, T., et al., 1991. Meta-analysis of therapist effects in psychotherapy outcome studies. Psychotherapy Research 1, 81–91.

Elkin, I., 1999. A major dilemma in psychotherapy outcome research: disentangling therapists from therapies. Clinical Psychology: Science and Practice 6, 10–32.

Elkin, I., Parloff, M.B., Hadley, S.W., Autry, J.H., 1985. NIMH treatment of depression collaborative research program: background and research plan. Archives of General Psychiatry 42, 305–316.

Elkin, I., Shea, T., Watkins, J.T., Imber, S.D., Sotsky, S.M., Collins, J.F., et al., 1989. National institute of mental health treatment of depression collaborative research program: general effectiveness of treatments. Archives of General Psychiatry 46, 971–982.

Elkin, I., Gibbons, R.D., Shea, M.T., Sotsky, S.M., Watkins, J.T., Pilkonis, P.A., et al., 1995. Initial severity and differential treatment outcome in the National Institute of Mental Health treatment of depression collaborative research program. Journal of Consulting and Clinical Psychology 63, 841–847.

Kenny, D.A., Judd, C.M., 1989. Consequence of violating the independence assumption in analysis of variance. Psychological Bulletin 99, 422–431.

Kim, D.A., Wampold, B.E., Bolt, D.M., in press. Therapist effects in psychotherapy: a random effects modeling of the NIMH TDCRP data. Psychotherapy Research.

Kirk, R.E., 1995. Experimental Design: Procedures for the Behavioral Sciences, 3rd ed. Brooks/Cole, Pacific Grove, CA.

Luborsky, L., McLellan, A.T., Diguer, L., Woody, G., Seligman, D.A., 1997. The psychotherapist matters: comparison of outcomes across twenty-two therapists and seven patient samples. Clinical Psychology: Science and Practice 4, 53–65.

Project MATCH Research Group, 1998. Therapist effects in three treatments for alcohol problems. Psychotherapy Research 8, 455–474.

Raudenbush, S.W., Bryk, A.S., 2002. Hierarchical Linear Models, 2nd ed. Sage, Thousand Oaks, CA.

Raudenbush, S.W., Bryk, A.S., Congdon, R., 2004. HLM: Hierarchical Linear and Nonlinear Modeling. HLM Software.

Sadock, B.J., Sadock, V.A., 2004. Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry, 9th ed. Lippincott Williams & Wilkins, New York.

Snijders, T., Bosker, R., 1999. Multilevel Analysis: an Introduction to Basic and Advanced Multilevel Modeling. Sage, London, UK.

Walsh, J.E., 1947. Concerning the effect of intraclass correlation on certain significance tests. Annals of Math Statistics 18, 88–96.

Wampold, B.E., 2001. The Great Psychotherapy Debate: Models, methods, and findings. Lawrence Erlbaum Associates, Mahwah, NJ.

Wampold, B.E., Serlin, R.C., 2000. The consequences of ignoring a nested factor on measures of effect size in analysis of variance. Psychological Methods 5, 425–433.