Psychological Medicine, 2007, **37**, 717–725. © 2006 Cambridge University Press
doi:10.1017/S0033291706009317 First published online 9 November 2006 Printed in the United Kingdom

Predictors of compliance with psychological interventions offered in the community

J. L. AYUSO-MATEOS[1]*, A. PEREDA[1], G. DUNN[2], J. L. VAZQUEZ-BARQUERO[3], P. CASEY[4], V. LEHTINEN[5], O. DALGARD[6], G. WILKINSON[7] AND C. DOWRICK[8]

[1] *Department of Psychiatry, Universidad Autónoma de Madrid, Hospital Universitario de la Princesa, Madrid, Spain*; [2] *Biostatistics Group, Division of Epidemiology & Health Sciences, The Medical School, University of Manchester, UK*; [3] *Department of Psychiatry, Universidad de Cantabria, Hospital Universitario Marqués de Valdecilla, Santander, Spain*; [4] *Department of Psychiatry, University College Dublin, Mater Misericordiae Hospital, Dublin, Ireland*; [5] *Stakes Mental Health Research Group, Turku, Finland*; [6] *National Institute of Public Health, Oslo, Norway*; [7] *Department of Psychiatry*, [8] *Department of Primary Care, University of Liverpool, UK*

ABSTRACT

Background. This study sought to evaluate the acceptance of two brief psychological interventions for depressed individuals, contacted through a community survey, and to look for predictors of adherence at the patient level.

Method. The authors used data from the Outcomes of Depression International Network (ODIN) study, which included a randomized controlled trial in which depressed individuals from five European countries, and nine geographical areas were assigned to one of three groups: individual problem-solving treatment, group psychoeducation, or control group. In this analysis, we included all of the individuals who had been assigned to one of the psychological interventions. Compliance with intervention was defined in two different ways. Multiple logistic regression was used to see which variables might predict an individual's compliance with psychological treatment.

Results. Psychological intervention was offered to 236 subjects. Treatment was completed by 128 subjects and not by 108 (compliance definition A). Three variables were found to have an effect on compliance A: the presence of a confidant, the use of antidepressant medication during the previous 6 months, and the previous use of any social or health services. On the other hand, 164 subjects had agreed to at least start the treatment, and 72 had not (compliance definition B). The three factors associated with compliance B were presence of a confidant, previous use of services, and the 'desire for change' score.

Conclusions. Social support and previous use of services are the main predictors of compliance with a psychological treatment in depressed individuals from the community. Implications for clinical practice and community programs are discussed.

INTRODUCTION

Many studies have vouched for the effectiveness of both psychotherapy and pharmacotherapy in depression (Simon, 2002). However, such interventions reach only a relatively small number of depressed people. A high percentage of those suffering from depression in the community never consult specifically for it; in primary care, only a certain proportion of depressed patients ever receive a depression diagnosis, and of those who do, only an even smaller proportion is correctly treated (Wilhelm & Lin, 2000). Moreover, when depressed patients are

* Address for correspondence: Professor José Luis Ayuso-Mateos, Servicio de Psiquiatría, Hospital Universitario de la Princesa, c/Diego de Leon 62, 28006 Madrid, Spain.
(Email: joseluis.ayuso@uam.es)

offered treatment, not all will comply and finish it. This scenario is a far from positive one for the secondary prevention of depressive disorders.

A number of studies have dealt with adherence to pharmacological treatments in depressed subjects (Lingam & Scott, 2002). Adherence has also been well studied in some medical diseases, such as HIV infection (Gordillo *et al*. 1999) and diabetes mellitus (Lustman & Clouse, 2002), as well as in some other psychiatric disorders (Steel *et al*. 2000; Mataix-Cols *et al*. 2002). Since all of these studies have paid special attention to psychological variables, it seems surprising that few studies dealing with depressed individuals have examined compliance with psychological treatments, and its predictors. This is even more surprising if we take into account the fact that depressive symptoms are, in themselves, factors which predispose to non-adherence in other medical and mental disorders (Ciechanowski *et al*. 2000; DiMatteo *et al*. 2000).

Few studies have examined predictors of compliance with psychological treatments in depressed individuals (Rabin *et al*. 1985; Persons & Burns, 1988; Oei & Kazmierczak, 1997; Derisley & Reynolds, 2000). Of these, none has studied this issue in a community sample. It has been documented that more than half of depressed individuals do not seek help from any health service. If we better understood the reason why depressed individuals fail to comply with a recommended treatment, we could introduce programmes in the community incorporating strategies aimed at reducing non-compliance. Therefore, our group was interested in detecting depressed individuals in the community, and offering them two different, brief psychological interventions. In the present paper, we use the analysis of our compliance results to examine (1) the acceptance of two brief psychological interventions for depressed individuals contacted through a community survey; and (2) predictors of compliance with this intervention, using two different definitions of compliance.

METHOD

In this analysis we have used data from the Outcomes of Depression International Network (ODIN) study, details of which have been published elsewhere (Dowrick *et al*. 1998; Ayuso-Mateos *et al*. 2001). Briefly, it is a European-wide project aimed at studying the prevalence and outcomes of depression in five countries and nine geographical areas. It was designed as a two-phase study, in which the Beck Depression Inventory (BDI) was used in the community to screen for potential cases of depression (Beck *et al*. 1961). All of those scoring at or above 12 (Lasa *et al*. 2000) were interviewed with the Schedules for Clinical Assessment in Neuropsychiatry (SCAN), which generated ICD-10 and DSM-IV depressive diagnoses (WHO, 1994). To assess for disability, the short form of the Medical Outcome Study (MOS) General Health Survey (SF36) was used (Ware & Sherbourne, 1992). Cognitive style was assessed using the Problem Solving Inventory (PSI) (Heppner & Peterson, 1982) and the Automatic Thoughts Questionnaire (ATQ) (Hollon & Kendall, 1980). The Client Service Receipt Inventory (CSRI) was used to assess service use among subjects (Beecham & Knapp, 1992). Social support (Miller & Ingham, 1976) and negative life-events (Brugha *et al*. 1985) were also evaluated.

The ODIN study design included a randomized controlled trial (RCT) comparing outcomes of individual problem-solving treatment in six sessions or group psycho-education in eight sessions, with depressed controls receiving no intervention. Follow-up after the intervention was conducted at 6 and 12 months. Results from the effectiveness study have already been published (Dowrick *et al*. 2000).

This is a secondary analysis, in which compliance with intervention was defined in two different ways, as shown by Dunn and co-workers (2003). Adherence to the allocated treatment was measured originally on a four-point nominal scale: attended/refused/discontinued/did not attend. This scale was dichotomized in one of two ways:

(1) Compliance definition A: attended was coded 1 and the rest 0.
(2) Compliance definition B: attended and discontinued were both coded 1 and the rest 0.

In this way, we can answer to two different questions:

(1) Which variables may predict that a person will attend and complete a brief psychological intervention?

https://doi.org/10.1017/S0033291706009317 Published online by Cambridge University Press

(2) Which variables may predict that a person will agree to and begin a brief psychological intervention?

Also, we wanted to know which variables could predict whether patients would complete the intervention once they had accepted it (i.e. what determines completion once a patient has started treatment?). To do this, we dropped from the analysis all those subjects who had refused treatment or failed to keep their appointments, and looked at differences between those who completed the sessions and those who discontinued them.

Variables that were thought to be possible predictors of adherence, and therefore included in the analysis, were selected because they had proved their predictive capacity in other studies, or because we wanted to test them specifically, which is the case of the cognitive style variables. All of these were patient level variables.

(*a*) Sociodemographic variables: these have been studied most in-depth, above all in studies that address compliance with treatment in medical diseases. Older age, marital status (married), and higher socioeconomic status (Hillis *et al*. 1993), as well as gender (female), have been associated with compliance, although these associations have been inconsistent across the studies.
(*b*) Clinical variables: subtype of depression and current use of antidepressants (Sirey *et al*. 1999) have shown their usefulness as compliance predictors in some studies.
(*c*) Severity of depression (BDI) has been tested in almost all studies, showing some evidence that higher scores are associated with worse compliance in psychological treatment of depression (Persons & Burns, 1988) and in other psychiatric disorders (Steel *et al*. 2000). Research in other medical fields has indicated that severity of co-morbid depression is a predictor variable of adherence to dietary recommendations for diabetes (Ciechanowski *et al*. 2000) and of adherence to antiretroviral therapy in HIV disease (Gordillo *et al*. 1999).
(*d*) Disability (SF36): perceived health status has been associated with compliance in some studies (Lenze *et al*. 2001).
(*e*) Cognitive style: PSI and ATQ.
(*f*) Contact with services in the previous 6 months: CSRI. We wanted to examine whether previous contact with any service predicted current compliance with a psychological intervention.
(*g*) Social support and negative life-events, which have been consistently associated with compliance in HIV disease (Ammasari *et al*. 2002).

Statistical analyses

Data were analysed using SPSS version 12.0 (SPSS Inc., Chicago, IL, USA). After some preliminary univariate analysis, each possible predictor was tested separately, taking into account the effect of country-specific characteristics, and the possible interaction between each variable and country. Afterwards, all the variables that had shown some effect on the dependent variables (Compliance A or B) were used to create a model by means of a multiple logistic regression.

RESULTS

Psychological intervention was offered to 236 subjects: 128 (54·2%) were included in the individual intervention group, and 108 (45·8%) in group intervention. Comparing the acceptance of these two modalities of psychological treatment, individual intervention was more likely to be followed. Of those subjects in the individual-treatment set 62·5% *versus* 44·4% of those in the group-treatment set attended all the sessions ($\chi^2 = 7{\cdot}69$, df = 1, $p < 0{\cdot}01$). Also, 79·7% of those participants in the individual modality of psychotherapy, *versus* 57·4% of those in the group modality, attended at least one session ($\chi^2 = 13{\cdot}7$, df = 1, $p < 0{\cdot}001$). However, once a subject had started the treatment programme, the number of completers was no higher among those subjects who had been given an individual modality of treatment (78·4% of those offered an individual problem-solving intervention completed the sessions, *versus* 77·4% of those offered a psychotherapeutic group). Type of intervention (individual *versus* group) and country were included in the models in order to control them statistically.

https://doi.org/10.1017/S0033291706009317 Published online by Cambridge University Press

Compliance definition A

Treatment was completed by 128 subjects, and not by 108 (including those subjects who refused, discontinued or did not attend the intervention).

There was an age difference between the groups, since the subjects who complied entirely with treatment were older (mean age 45·9 years, S.D. = 9·6) than the subjects who did not attend all the sessions (mean age 43·4 years, S.D. = 11·7); however, this difference did not reach statistical significance ($t = -1{\cdot}8$, $p = 0{\cdot}07$). The two groups were also different in their previous use of services, and use of antidepressant medication. Those in the compliance group were more likely to have used any service during the previous 6 months (78·9% among the compliers, *versus* 63% among the non-compliers; $\chi^2 = 7{\cdot}3$, df = 1, $p < 0{\cdot}01$), and to be taking antidepressants (34·4% *versus* 20·4%; $\chi^2 = 5{\cdot}7$, df = 1, $p < 0{\cdot}05$). Compliers were also more likely to have a confidant ($\chi^2 = 6{\cdot}6$, df = 1, $p < 0{\cdot}01$). Although women were better compliers than men, this result did not reach statistical significance ($\chi^2 = 3{\cdot}16$, df = 1, $p = 0{\cdot}07$). No significant differences were found between compliers and non-compliers regarding mean scores on the scales used (BDI, SF-36, ATQ and PSI), nor were there any differences between the groups in marital status, income, or the presence of life events. Lastly, we found striking differences among the five countries ($\chi^2 = 11{\cdot}02$, df = 4, $p < 0{\cdot}05$). Therefore, the country effect was tested along with all of the variables, and in interaction with them. When a variable was still significant or when it was significant in interaction with country, it was used in the construction of the best predictive model of compliance in the multiple logistic regression analysis.

In the multiple logistic regression analysis, the best predictive model for compliance A (Table 1) included having used any health service, the presence of a confidant, and use of antidepressant medication during the previous 6 months. Subjects who had previously used any health service [odds ratio (OR) 2·1] and were on antidepressants (OR 1·93) were more likely to adhere to the treatment offered. Better compliance was also associated with the presence of a confidant (OR 3·1).

Table 1. *Predictors of compliance: A, multiple logistic regression*

Variables	B[a] (S.E.)	Wald	Sig.	Exp (B)	95% CI
Country		8·98	0·06		
Eire (reference)					
Finland	0·19 (0·97)	0·04	N.S.	1·21	0·18–8·04
Norway	0·30 (0·59)	0·25	N.S.	1·34	0·42–4·32
Spain	−0·04 (1·04)	0·002	N.S.	0·96	0·12–7·38
UK	−0·86 (0·86)	0·99	N.S.	0·42	0·08–2·30
Type of intervention	−1·21 (0·70)	2·80	0·09	0·30	0·07–1·23
Having a confidant	1·13 (0·49)	5·27	0·02	3·10	1·18–8·09
Use of antidepressants	0·66 (0·33)	3·85	0·05	1·93	1·001–3·70
Use of services	0·74 (0·32)	5·19	0·02	2·10	1·11–3·97

[a] B = log (odds ratio).
CI, Confidence interval.

Compliance definition B

This time, we grouped the subjects according to the following definition of compliance: subjects who attended all the sessions or discontinued the treatment were considered compliers, whilst subjects who refused or did not attend any sessions were considered non-compliers. Following this definition, 164 subjects were compliers and 72 were non-compliers.

In the univariate analysis, the presence of a confidant ($\chi^2 = 5{\cdot}2$, df = 1, $p < 0{\cdot}05$), use of health services ($\chi^2 = 5{\cdot}6$, df = 1, $p < 0{\cdot}05$), and use of antidepressants ($\chi^2 = 3{\cdot}7$, df = 1, $p = 0{\cdot}05$) differentiated the group of compliers from the group of non-compliers. No differences were found between the two groups in any of the scales used except for the score in the subscale 'desire for change' of the ATQ ($t = -1{\cdot}9$, $p = 0{\cdot}05$), where the score of the compliers was higher than that of the non-compliers. Again, there were significant differences between the five countries ($\chi^2 = 13{\cdot}4$, df = 4, $p < 0{\cdot}01$). As with compliance A, the country effect was tested along with all of the variables and in interaction with them.

In the logistic regression analysis, three variables constituted jointly the best predictive compliance B model (Table 2): use of services, presence of a confidant, and score on the 'desire for change' subscale on the ATQ. The presence of a confidant increased the probability that a subject would start psychological treatment (OR 3·38), as well as the score on the 'desire for change' subscale (OR 1·08) and previous use of services in the past 6 months (OR 2·31).

https://doi.org/10.1017/S0033291706009317 Published online by Cambridge University Press

Table 2. *Predictors of compliance*: *B*, *multiple logistic regression*

Variables	B^a (S.E.)	Wald	Sig.	Exp (*B*)	95%CI
Country					
Eire (reference)		7·22	N.S.		
Finland	−0·08 (1·02)	0·006	N.S.	0·93	0·13–6·83
Norway	−0·04 (0·61)	0·005	N.S.	0·96	0·29–3·16
Spain	−0·90 (1·08)	0·69	N.S.	0·40	0·05–3·4
UK	−1·20 (0·82)	2·25	N.S.	0·29	0·06–1·46
Type of intervention	−1·98 (0·7)	8·10	0·005	0·14	0·03–0·54
Presence of confidant	1·22 (0·51)	5·77	0·02	3·38	1·25–9·12
Use of service	0·84 (0·36)	5·47	0·02	2·31	1·14–4·67
Desire for change	0·07 (0·03)	4·33	0·04	1·08	1·004–1·15

[a] B = log (odds ratio).
CI, Confidence interval.

Finally, we wanted to look at differences between those who completed the sessions and those who discontinued them. To make sure that these results were independent, we dropped from the analysis those subjects who did not attend a single session. A total of 128 subjects completed the treatment, and 36 discontinued it. In univariate analysis, these two groups were different in the following aspects: age, with completers being older than non-completers ($t = -2·2$, $p < 0·05$); gender, with more women in the completers group than in the other group (70·3% *versus* 47·2%; $\chi^2 = 6·6$, df = 1, $p < 0·01$); concern shown by others, in that more subjects in the completers group considered the concern shown by others to be in the categories of 'some' and 'lots', compared with the higher frequency in the group of non-completers, who rated the concern shown by others as 'none', 'little', or 'uncertain' (67·2% *versus* 61·1%; $\chi^2 = 9·5$, df = 1, $p < 0·005$); presence of life events in the past 6 months, since 82% of subjects who discontinued had experienced a life event, compared with 64% of subjects who completed treatment ($\chi^2 = 3·9$, df = 1, $p < 0·05$); presence of long-term illness (L/T illness) or disability (51·2% of the subjects who completed had a L/T illness or disability compared with 27·8% who discontinued it; $\chi^2 = 6·2$, df = 1, $p < 0·05$).

Finally, once a subject was assigned to an intervention group, the probability of attending all the sessions was not influenced by the type of treatment (individual *versus* group modality) ($\chi^2 = 0·02$, df = 1, $p > 0·05$). Moreover, the country variable was no longer significant ($\chi^2 = 5·7$, df = 4, $p > 0·05$).

In the multiple logistic regression analysis, we obtained a model that classified correctly 79·5% of the subjects (Table 3). Being female (OR 2·99), having a L/T illness or disability (OR 4·28), and rating the concern shown by others as 'some' or 'lots' (OR 3·13) increased the probability that a subject would complete treatment.

DISCUSSION

Our study has some limitations. First, it is a secondary exploratory analysis of a multicentre clinical trial. The main purpose of the original study was not to detect predictors of adherence, but to determine the effectiveness of two brief psychological interventions. Also, adherence is influenced by many variables, whose interaction can also be a determining factor (patient, family, clinician, the environment, and even the kind of treatment). In the present study, we have focused only on patient variables, thus limiting our conclusions, because they do not take into account other aspects also considered important within the currently accepted theoretical models of adherence (Nemeroff, 2003; Byrne *et al.* 2006). Moreover, we did not include in the protocol some other factors that might be associated with adherence, such as the patient-therapist relationship or patients' personal reasons for not complying with treatment; therefore, our results do not reflect the patients' attitudes and opinions about their illness and the proposed interventions. Finally, we did not assess the personality of the subjects in the first stage of the ODIN project, the community survey. One of the reasons for not including a personality assessment at baseline was that the protocol was quite exhaustive, and reliable personality tests are too long to be included in a study whose main aim is to detect depression in the community. Also, clinical evidence has shown the unreliability of measuring personality in depressed individuals, since scores on personality tests might be influenced by the affective state of the subjects at a given moment.

Taking into account these limitations, to date there has been no study specifically addressing adherence to psychological interventions in depressed subjects detected through a community survey. It is this particular aspect that makes

https://doi.org/10.1017/S0033291706009317 Published online by Cambridge University Press

Table 3. *Predictors of completing the treatment* (*conditional on having started it*): *multiple logistic regression*

Variables	B[a] (S.E.)	Wald	Sig.	Exp (B)	95% CI
Country					
Eire (reference)		2·53	N.S.		
Finland	0·65 (0·86)	0·56	N.S.	1·90	0·35–10·39
Norway	0·32 (0·86)	0·14	N.S.	1·37	0·26–7·37
Spain	7·34 (16·76)	0·19	N.S.	1548	$0–2·9 \times 10^{17}$
UK	−0·18 (0·85)	0·04	N.S.	0·83	0·16–4·08
Gender	1·09 (0·45)	6·02	0·01	2·99	1·25–7·17
Long-term illness or disability	1·45 (0·47)	9·49	0·002	4·28	1·70–10·8
Concern shown by others	1·14 (0·43)	6·95	0·008	3·13	1·34–7·31

[a] B = log (odds ratio).
CI, Confidence interval.

our results unique, since the majority of studies look at patients who attend specific health services, and it has been established that a high proportion of depressed subjects do not attend any service whatsoever. Clearly, factors able to predict attendance on a treatment programme offered in the community will not be the same as those predicting attendance in patients offered such a programme in a primary care or specialized services context, because the population given access to the intervention is broader in the first case. On the other hand, few studies have addressed adherence to psychological interventions in depressed subjects, compared with the relatively large amount of literature on adherence to pharmacological treatments (Lingam & Scott, 2002).

Of all the patients offered a psychological intervention, 69% started it and 54% completed the treatment. Although this rate of compliance is low, it is similar to that found in studies on compliance with antidepressant medications (WHO, 2003). Moreover, this rate of compliance might even be considered relatively high if we take into account that our sample is taken from the community, and therefore comprises depressed patients who did not ask specifically for psychotherapeutic help. Of those subjects who started treatment, 78% completed it, which is a low drop-out rate, perhaps related to the relatively brief length of the sessions. Regarding this aspect, Simons and colleagues (1984) asked patients their reasons for dropping out of their particular therapy for depression. The main reasons given were related to time, fees, and problems with transportation. In the present study, the latter two could not be causes for non-compliance, since patients did not have to pay for the sessions and the therapist visited patients' homes when they could not attend the clinical site.

One of the most important findings from the present study is that social support is a predictor of better compliance with a psychological treatment. Our results show that subjects who have a confidant are more likely to accept a psychological treatment, and complete it. Also, those subjects who consider that others feel concern for them are more prone to complete the treatment. However, the presence of a confidant does not seem to have an impact on treatment completion when we take into account only those subjects who agreed to start it. This lack of influence might be related to the small size of the discontinuation group, which reduced the probability of finding differences. In any case, the association between social support and compliance is quite consistent across the analyses. The importance of social support in the prevention of a variety of pathologies, and its influence in reducing the amount of medication required, accelerating recovery and facilitating compliance with prescribed medical regimens, has long been well known (Cobb, 1976). This finding, that is, the influence of social support on adherence, is in accordance with more up-to-date studies of adherence to antiretroviral medication in HIV (Gordillo *et al.* 1999; Ammasari *et al.* 2002). To our knowledge, studies trying to test variables able to predict compliance with psychological treatments in depression have not looked at social support; this is surprising, when we consider that social support is a psychosocial variable which should

be considered in every psychological treatment, regardless of the therapist's orientation.

Previous use of health services might also predict whether a subject would agree to start a psychological treatment programme. In connection with this variable is our finding that the use of antidepressants in the previous 6 months differentiates between subjects who completed the sessions and those who did not. Sirey and co-workers (1999), in a study aimed at finding predictors of antidepressant prescription in outpatients with major depression receiving treatment in mental health clinics, found indirectly that recent use of antidepressants was a significant predictor of adherence to recommended medication. It is not surprising that those individuals who use health services also have a tendency to be compliers. The problem arises when we think of those subjects who are *not* good compliers. How can we engage them in psychotherapy for depression if they do not use any service? We need to develop new methods in order to effectively connect with this group of depressed individuals who are reluctant to be treated. Local community services and media campaigns might be used to reach these subjects and to offer them educational messages about depressive illness and the importance of seeking help earlier for this tractable condition.

The fact that the 'desire for change' subscale from the ATQ is related to starting treatment is not difficult to explain. It is generally accepted that the most important reason for starting a psychological treatment is the desire for change. Non-adherence, therefore, might in some way be an expression of resistance to change. Derisley & Reynolds (2000) studied the Transtheoretical Model of Change to predict, in a group of 60 subjects referred for psychotherapy, the number of sessions attended and rate of premature drop-out. They found that low contemplation scores predicted premature termination. The 'contemplation phase' is related, according to this model, with awareness of the problem and eagerness to talk about it, although there is a lack of commitment to take necessary actions for change. It is not difficult to explain why a subject with a desire for change, who is aware of his or her problem and suffers from it, has a tendency to engage in treatment.

In our analysis, previous use of health services is not so important in differentiating between completers and discontinuers once the first contact has taken place. From that point on, there are some other factors which play an important role in maintaining a person in therapy until planned termination. Among those, besides the concern that others show in the patient, are the presence of a long-term illness or disability and gender. There might be different reasons why a disabled person is most likely to complete the treatment once it has been started. More availability of time, more suffering and different ideas of what should be expected from the sessions in terms of help might explain higher adherence.

In the present analysis, we have found that the factors of female gender and social support can predict that a subject will complete a psychological intervention. As Dalgard and colleagues (2006) suggested, it might be that women are more prone to sharing their problems with other people, feeling that they obtain more help from it. Women could also be more open than men to psychotherapeutic help, as they may see the process of sharing their problems as more helpful than men do. The relationship between age and gender and compliance is controversial. Regardless of type of treatment or illness, some studies have shown that younger subjects (Hillis *et al*. 1993; Gordillo *et al*. 1999) and men (Fuciec *et al*. 2003) are more likely to drop out from treatment, whilst others have not found any effect of age (Steel *et al*. 2000) or gender in adherence to treatment. As we have stated before, we have found that women are less likely than men to drop out. Regarding age, although univariate analysis show that older age is related with better compliance, when other variables are introduced in the analysis, age loses its effect.

As noted above, our findings are somewhat different to those of other studies which have focused on different samples. For example, we did not find that severity of depression is related to compliance. Oei and Kazmierczak (1997) studied acceptance of group cognitive behaviour therapy, and nor did they find that measures of depressive symptoms discriminated between drop-outs and completers. However, numerous studies have found this correlation, that is, that subjects who score higher on severity measures (such as the BDI) show worse adherence to psychological treatments in depression (Persons

& Burns, 1988), with psychological treatments in other psychiatric illnesses (Steel *et al*. 2000), with pharmacological treatments in depression (Sirey *et al*. 2001), or with adherence to treatment and medical recommendations in other physical diseases (Gordillo *et al*. 1999; Ciechanowski *et al*. 2000; DiMatteo *et al*. 2000). Moreover, our findings do not indicate that SF-36 scores are related to compliance, regardless of the definition used. Lenze and colleagues (2001) reported that lower self-rated health was a predictor of early treatment discontinuation; however, their sample included only seven drop-outs, and was composed of subjects aged 60 and older. Therefore, their results and ours are not comparable, because the reasons for non-compliance in an older sample are likely to be different than in a younger one.

There are two important conclusions that can be drawn from these findings. First, social support and previous use of service are the main predictors of compliance with a psychological treatment. If we want to design a programme to engage depressed individuals from the community in brief psychological therapies, we should have in mind that the programme must reach people who might be socially isolated and do not attend any social or health service. Campaigns which aim to reduce the burden of depression in the community should use alternative ways to reach these individuals, as well as the traditional ones. Secondly, the factors that predict attendance at psychological therapy sessions are different from those that predict completion of treatment once it has been started. Again, social support is important, but also we should bear in mind that men and subjects who do not show a disability, are more likely to abandon treatment. Men might be less likely to try verbal therapy than women, and might question its usefulness. Also, those who do not have a long-term illness or do not have a disability might see themselves as less sick, and might think that their depression is not an illness to be treated.

ACKNOWLEDGEMENTS

Financial support for the ODIN Project, in addition to that provided by the EC Biomed 2 programme, has come from the English National Health Service Executive North West Research and Development Office (Contract RDO/18/31); Spanish F.I.S. (Exp. No. 96/1798); Wales Office of Research and Development (Contract RC092); Norwegian Research Council, Council for Mental Health and Department of Health and Social Welfare; and the Finnish Pensions Institute of Agricultural Entrepreneurs (Contract 0339). The work of Amada Pereda was supported by the Spanish Fondo de Investigación Sanitaria (contract no. 02/10069).

DECLARATION OF INTEREST

None.

REFERENCES

Ammasari, A., Trotta, M. P., Murri, R., Castelli, F., Narciso, P., Noto, P., Vecchiet, J., D'Arminio, M. A., Wu, A. W. & Antinori, A. (2002). Correlates and predictors of adherence to highly active antiretroviral therapy: overview of published literature. *Journal of Acquired Immune Deficiency Syndrome* **31** (Suppl. 3), 123–127.

Ayuso-Mateos, J. L., Vazquez-Barquero, J. L., Dowrick, C., Lehtinen, V., Dalgard, O. S., Casey, P., Wilkinson, C., Lasa, L., Page, H., Dunn, G. & Wilkinson, G. (2001). Depressive disorders in Europe: prevalence figures from the ODIN study. *British Journal of Psychiatry* **179**, 308–316.

Beck, A., Ward, C. & Mendelson, M. (1961). An inventory for measuring depression. *Archives of General Psychiatry* **4**, 561–571.

Beecham, J. & Knapp, M. (1992). Costing psychiatric interventions. In *Measuring Health Needs* (ed. G. Thornicroft, C. Brewin and J. Wing). Gaskell: London.

Brugha, T., Bebbington, P., Tennant, C. & Hurry, J. (1985). The list of threatening experiences: a subset of 12 life event categories with considerable long-term contextual threat. *Psychological Medicine* **15**, 189–194.

Byrne, N., Regan, C. & Livingston, G. (2006). Adherence to treatment in mood disorders. *Current Opinion in Psychiatry* **19**, 44–49.

Ciechanowski, P. S., Katon, W. J. & Russo, J. E. (2000). Depression and diabetes: impact of depressive symptoms on adherence, function and costs. *Archives of Internal Medicine* **160**, 3278–3285.

Cobb, S. (1976). Social support as a moderator of family stress. *Psychosomatic Medicine* **38**, 300–314.

Dalgard, O., Dowrick, C., Lehtinen, V., Vazquez-Barquero, J. L., Casey, P., Wilkinson, G., Ayuso-Mateos, J. L., Page, H., Dunn, G. & The ODIN Group (2006). Negative life events, social support and gender difference in depression: a multinational community survey with data from the ODIN study. *Social Psychiatry and Psychiatric Epidemiology* **41**, 444–445.

Derisley, J. & Reynolds, S. (2000). The transtheoretical stages of change as a predictor of premature termination, attendance and alliance in psychotherapy. *British Journal of Clinical Psychology* **39**, 371–382.

DiMatteo, M. R., Lepper, H. S. & Croghan, T. W. (2000). Depression as a risk factor for non-compliance with medical treatment: meta-analysis of the effects of anxiety and depression on patient adherence. *Archives of Internal Medicine* **160**, 2101–2107.

Dowrick, C., Casey, P., Dalgard, O., Hosman, C., Lehtinen, V., Vazquez-Barquero, J. L. & Wilkinson, C. (1998). Outcomes of Depression International Network (ODIN). Background, methods and field trials. ODIN Group. *British Journal of Psychiatry* **172**, 359–363.

Dowrick, C., Dunn, G., Ayuso-Mateos, J. L., Dalgard, O. S., Page, H., Lehtinen, V., Casey, P., Wilkinson, C., Vazquez-Barquero, J. L. & Wilkinson, G. (2000). Problem solving treatment and group psychoeducation for depression: multicentre ransomised controlled trial. Outcomes of Depression International Network (ODIN) Group. *British Medical Journal* **321**, 1450–1454.

Dunn, G., Maracy, M., Dowrick, C., Ayuso-Mateos, J. L., Dalgard, O. S., Page, H., Lehtinen, V., Casey, P., Wilkinson, C., Vazquez-Barquero, J. L. & Wilkinson, G. (2003). Estimating psychological treatment effects from a randomised controlled trial with both non-compliance and loss to follow-up. *British Journal of Psychiatry* **183**, 323–331.

Fuciec, M., Mohr, S & Garin, C. (2003). Factors and motives associated with drop-out in an ambulatory service for patients with psychotic disorders. *European Psychiatry* **18**, 193–196.

Gordillo, V., Del Amo, J., Soriano, V. & Gonzalez-Lahoz, J. (1999). Sociodemographic and psychological variables influencing adherence to antiretroviral therapy. *AIDS* **13**, 1763–1769.

Heppner, P. & Peterson, C. (1982). The development and implications of the problem solving inventory. *Journal of Counselling Psychology* **29**, 66–75.

Hillis, G., Alexander, D. A. & Eagles, J. M. (1993). Premature termination of psychiatric contact. *International Journal of Social Psychiatry* **39**, 100–107.

Hollon, S. & Kendall, P. (1980). Cognitive self-statements in depression: development of an automatic thoughts questionnaire. *Cognitive Therapy Research* **4**, 383–395.

Lasa, L., Ayuso-Mateos, J. L., Vazquez-Barquero, J. L., Diez-Manrique, F. J. & Dowrick, C. (2000). The use of the Beck Depression Inventory to screen for depression in the general population: a preliminary analysis. *Journal of Affective Disorders* **57**, 261–265.

Lenze, E. J., Miller, M. D., Dew, M. A., Martire, L. M., Mulsant, B. H., Begley, A. E., Schulz, R., Frank, E. & Reynolds, C. F. (2001). Subjective health measures and acute treatment outcomes in geriatric depression. *International Journal of Geriatric Psychiatry* **16**, 1149–1155.

Lingam, R. & Scott, J. (2002). Treatment non-adherence in affective disorders. *Acta Psychiatrica Scandinavica* **105**, 164–172.

Lustman, P. J. & Clouse, R. E. (2002). Treatment of depression in diabetes: impact of mood and medical outcome. *Journal of Psychosomatic Research* **53**, 917–924.

Mataix-Cols, D., Marks, I. M., Gresist, J. H., Kobak, K. A. & Baer, L. (2002). Obsessive-compulsive symptom dimensions as predictors of compliance with and response to behaviour therapy: results from a controlled trial. *Psychotherapy and Psychosomatics* **71**, 255–262.

Miller, P. M. & Ingham, J. G. (1976). Friends, confidants and symptoms. *Social Psychiatry* **11**, 51–58.

Nemeroff, C. B. (2003). Improving antidepressant adherence. *Journal of Clinical Psychiatry* **64** (Suppl. 18), 25–30.

Oei, T. P. & Kazmierczak, T. (1997). Factors associated with dropout in a group cognitive behaviour therapy for mood disorders. *Behaviour Research and Therapy* **35**, 1025–1030.

Persons, J. B. & Burns, D. D. P. J. M. (1988). Predictors of dropout and outcome in cognitive therapy for depression in a private practice setting. *Cognitive Therapy and Research* **12**, 557–575.

Rabin, A. S., Kaslow, N. J. & Rehm, L. P. (1985). Factors influencing continuation in a behavioural therapy. *Behaviour Research and Therapy* **23**, 695–698.

Simon, G. E. (2002). Evidence review: efficacy and effectiveness of antidepressant treatment in primary care. *General Hospital Psychiatry* **24**, 213–224.

Simons, A. D., Levine, J. L., Lustman, P. J. & Murphy, G. E. (1984). Patient attrition in a comparative outcome study of depression. A follow-up report. *Journal of Affective Disorders* **6**, 163–173.

Sirey, J. A., Bruce, M. L., Alexopoulos, G. S., Perlick, D. A., Friedman, S. J. & Meyers, B. S. (2001). Stigma as a barrier to recovery: perceived stigma and patient-rated severity of illness as predictors of antidepressant drug adherence. *Psychiatric Services* **52**, 1615–1620.

Sirey, J. A., Meyers, B. S., Bruce, M. L., Alexopoulos, G. S., Perlick, D. A. & Raue, P. (1999). Predictors of antidepressant prescription and early use among depressed outpatients. *American Journal of Psychiatry* **156**, 690–696.

Steel, Z., Jones, J., Adcock, S., Clancy, R., Bridgford-West, L. & Austin, J. (2000). Why the high rate of dropout from individualized cognitive-behavior therapy for bulimia nervosa? *International Journal of Eating Disorders* **28**, 209–214.

Tilson, H. H. (2004). Adherence or compliance? Changes in terminology. *Annals of Pharmacotherapy* **38**, 161–162.

Ware, J. J. & Sherbourne, C. D. (1992). The MOS 36-item short-form health survey (SF-36). I. Conceptual framework and item selection. *Medical Care* **30**, 473–483.

WHO (1994). *Schedules for Clinical assessment in Neuropsychiatry*. World Health Organisation: Geneva.

WHO (2003). *Adherence to Long-Term Therapies: Evidence for Action*. World Health Organisation: Geneva.

Wilhelm, K. & Lin, E. (2000). Unmet need in depression: varying perspectives on need. In *Unmet Need in Psychiatry* (ed. G. Andrews and S. Henderson). Cambridge University Press: Cambridge.