Cover Page

Universiteit Leiden

The handle http://hdl.handle.net/1887/43602 holds various files of this Leiden University dissertation.

Author: Fenema, E.M. van
Title: Treatment quality in times of ROM
Issue Date: 2016-09-15

Chapter 6

Vitality predicts level of guideline-concordant care in routine treatment of mood, anxiety and somatoform disorders

Esther van Fenema
Nic van der Wee
Erik Giltay
Margien den Hollander-Gijsman
Frans Zitman

Journal of Evaluation in Clinical Practice 18 (2012) 441–448

Abstract

Objective: To examine the clinical and psychosocial correlates of adherence to treatment guidelines among outpatients with common mental disorders in a routine clinical setting.

Methods: In this retrospective cohort study, we analyzed 192 patients who were treated for a mood, anxiety or somatoform disorder with pharmacotherapy, psychotherapy or a combination of both treatment modalities. Guideline adherence was assessed with a disorder independent set of quality indicators during up to 3 years of follow-up. At baseline, a standardized diagnostic interview, the Brief Symptom Inventory (BSI), the Short Form 36 (SF-36) and demographic variables were assessed. Using multivariable regression analysis we identified independent predictors associated with guideline adherence.

Results: Patients were aged 36.8 years (SD 11.6) on average. The majority of patients were treated with psychotherapy (47.4%), followed by pharmacotherapy (37.5%) and a combination of pharmacotherapy and psychotherapy (15.1%). Three adherence groups were defined: low (29.7%), intermediate (43.2%) and high (27.1%). Univariate predictors of low adherence were low scores on the subscales vitality and social functioning of the SF-36. In the multivariable model, low adherence was independently predicted by a score lower than 50 on the subscale vitality of the SF-36 (odds ratio per 10 units increase in vitality = 1.34, 95% confidence interval: 1.06–1.71). No significant differences were found within sociodemographic variables, co-morbidity and the scores on the BSI subscales between the adherence groups.

Conclusions: We found that patients with low scores on the vitality subscale of the SF-36 were at the highest risk to receive low guideline-concordant care. Understanding factors that affect treatment adherence may help to prevent non-adherence and increase the quality of care as well as cost-effectiveness.

Introduction

Over the past decades the selection of treatment for patients with psychiatric disorders has gradually shifted from an approach based on clinical expertise towards evidence-based medicine. In many countries, psychiatric organisations and services have now formulated and implemented evidence-based guidelines for the pharmacological and psychological treatment of psychiatric disorders or follow those from international organisations. The goal of many guidelines is to improve quality of care by articulating best-practice and evidence-based models and attempting to reduce the variance around these models by making explicit both the rationale for the guidelines and the steps needed to implement optimal treatment. [1,2]

During the last ten years several studies assessing the adherence to guidelines in clinical practice have been published. Most studies noticed a substantial discrepancy between guideline recommendations and clinical practice. [3,4] Whatever criterion is used, the results suggest substantial non-adherence.

Some studies used adherence levels as outcome, i.e. low, moderate and high levels of adherence; other studies used percentages to describe the level of adherence. Deviation of the guidelines may comprise choice of medication, medication dosage, duration of pharmacotherapy, frequency of visits, treatment of co-morbidity and several principles of psychotherapy. [5-24]

Several studies retrospectively analysed patient characteristics that were associated with receiving guideline concordant care. Younger age, male gender, lower socioeconomic status, minority status and poorer social functioning were associated with adherence problems. Additional factors associated with low adherence were poor insight in mental condition, low accessibility of care, having a co-morbid psychiatric disorder and (severe) side effects of psychotropic medication. [25-34]

In a previous study we found that treatment modality played an important role in adherence to guidelines, as lower scores were observed in patients that received combined treatment compared to treatment with psychotherapy or pharmacotherapy alone. [35]

Until now, studies combining socio-demographic and psychometric data to determine statistically independent patient factors affecting guideline concordant therapy in mental health are scarce. [36] It is important to identify

the patient factors that contribute to low or non-adherence, in order to select the appropriate patient-centred strategies for prevention.
In order to identify patient-related factors of guideline non-adherence, we examined the clinical and psychosocial correlates of adherence to guidelines among outpatients who started an acute phase treatment for a mood, anxiety or somatoform disorder. Patients at our clinic are routinely assessed with a set of diagnose-specific and generic psychometric instruments. As we wanted to examine adherence across diagnoses, we selected two generic measures to predict guideline adherence: the Brief Symptom Inventory [37] because of its cross-diagnostic characteristics and the Dutch version of the Short Form 36 [38,39] to assess generic health status. In this retrospective cohort of 192 patients with mood, anxiety or somatoform disorders, we studied psychiatric characteristics in addition to socio-demographic in relation to guideline adherence.

Material and methods

Rivierduinen

The use of evidence based guidelines and outcomes measurement is integrated in routine practice in Rivierduinen, a regional mental health care provider (RMHCP) in the Netherlands. Rivierduinen provides secondary mental health care for an area with over one million inhabitants. In the Netherlands access to mental health care is not limited by insurance or financial status. Health insurance is compulsory for all citizens, and for patients without medical insurance, like illegal immigrants, psychiatric services provide all care free of charge.
The implementation of guidelines and a system for Routine Outcome Measurement (ROM) started in 2002, in collaboration with the department of psychiatry of the Leiden University Medical Hospital.

Guidelines

The standard guidelines in the Netherlands are the Multidisciplinary Guidelines, formulated by a collaboration of the Dutch Association of Psychiatry, Psychology and General Practitioners (www.trimbos.nl). These guidelines describe the treatment-steps for many psychiatric disorders. When multidisciplinary

guidelines were not available for specific disorders, the guidelines formulated by the Dutch Association of Psychiatry were implemented by the RMHP Rivierduinen (www.nvvp.net). The local stepped care-based programs follow the above national guidelines and were slightly adjusted to the local setting (most importantly by adding ROM as an element of treatment). Programs have been formulated for unipolar depressive, anxiety or somatoform disorders and describe which treatment modality, form and frequency of psychotherapy and, in the case of pharmacotherapy, which group of medication should be selected for the treatment of specific disorders. Also, information on the duration of each treatment step is available and it is indicated when to switch to the next step. For example: the first step in the treatment of unipolar depression without psychotic symptoms is a selective serotonin reuptake inhibitor (SSRI) for at least six weeks or cognitive behavioral therapy (CBT) for 12 weeks, with a frequency of one session every week. At the end of this first step the patient has to be measured with ROM to assess whether the chosen treatment is effective or not. (Detailed guidelines are available from the first author)

Patients

For each year we randomly selected 100 consecutive patients who met the inclusion criteria: at least one treatment session with their therapist after the diagnostic phase and mastering of a sufficient body of the Dutch language to complete the ROM assessments. From January 2004 through January 2006 in total approximately 3000 patients between 18 and 65 years old, started treatment for an unipolar depressive, anxiety or somatoform disorder. Patients, between 18 and 65 years old, were assigned to receive treatment for the acute phase of a DSM-IV depressive, anxiety or somatoform disorder. A total of 300 patients met the inclusion criteria. Of this group of patients 192 (64%) had a ROM baseline assessment available. The remaining 108 patients were not assessed due to insufficient mastering of the Dutch language or because of logistical reasons, such as missed appointments.

Treatment groups

The multidisciplinary guidelines explicitly mention three treatment modalities: pharmacotherapy, psychotherapy and the combination therapy. In the case of pharmacotherapy (PhT) patients were treated by a psychiatrist or by a resident in psychiatry, supervised by a psychiatrist. In the case of psychotherapy (PsT),

patients were treated by a psychotherapist or by a resident in psychiatry supervised by a psychotherapist. In the case of combination therapy (CT), patients could be treated by one therapist (psychiatrist), but also by combinations of supervised residents, psychiatrists and psychotherapists. As different treatment modalities and different therapists might have an effect on guideline adherence, we categorized patients in the above mentioned treatment groups.

Routine Outcome Monitoring (ROM)

During the intake phase, baseline assessments comprised a standardized diagnostic interview (Dutch version of the Mini-International Neuropsychiatric Interview Plus, version 5.00-R; MINI-Plus) focussing on DSM-IV-TR diagnosis [40,41], collection of sociodemographic and socioeconomic data, observer-rated scales and self-report questionnaires, and general measures of health and quality of life in order to assess psychopathology dimensionally as well as categorically. Both generic and disorder-specific scales were used. The observational scales were completed in a face-to-face interview, whereas the self-report questionnaires were filled out by the patient using a touch-screen computer. Trained research nurses performed the assessments An outcome assessment after three to four months included all the above with the exception of the MINI-Plus and the short form of the Dimensional Assessment of Personality Pathology-Basic Questionnaire (DAPP-SF) [42], which were administered only at the baseline assessment. A ROM outcome assessment session took on average one hour. For our study, baseline ROM-assessments were used.

Indicators

A consensus panel of senior psychiatrists from RMHCP Rivierduinen and the department of psychiatry of the Leiden University Medical Center defined eight disorder-independent indicators.

The indicators were based on the above-mentioned guidelines and we selected data that could be reliably extracted for the majority of the delivered treatments. Some more detailed data on the delivered treatments, like compliance to pharmacotherapy or whether psychotherapy sessions strictly followed the manuals were not available in a consistent manner. As recommended in the literature, we conducted a pilot-study to assess the feasibility of our approach. [43]

The first indicator (treatment modality according to guideline) shows whether a correct treatment for the primary DSM-IV diagnosis as mentioned in the guidelines, has been applied. For example: the correct treatment for a panic disorder should be a SSRI or CBT.
The second indicator assesses whether the stepped care principle has been followed, For example: the first step in the treatment of unipolar depression without psychotic symptoms is a SSRI and not a tricyclic antidepressant (TCA), which is the second step according to the Dutch guidelines.
Depending on the guideline, patients receive psychotherapy or medication or both. In the case of medication treatment we defined two indicators. The first assesses whether the medication has been increased to the minimal dose that has been listed for the specific medicament in the guidelines. The second indicator for medication treatment measures whether the duration of pharmacotherapy has been at least six weeks. We choose six weeks, as this is the common minimal duration formulated in all the guidelines that were implemented in our clinic.
Treatment with psychotherapy was also evaluated with two indicators, again based on common characteristics of all the guidelines. The first assessed the minimal duration of 12 weeks. This is the minimal duration formulated for psychotherapy in all the guidelines. The second indicator assessed the frequency of psychotherapy. As psychotherapy sessions in routine clinical practice often fail to obtain a frequency of once a week, because sessions are canceled due to holidays or personal circumstances from both patient and therapist, the consensus panel judged a minimal frequency of one session every one and half weeks to reflect the frequency as demanded by guidelines. The indicators for psychotherapy are not applicable to Eye Movement Desensitization and Reprocessing (EMDR). Duration and frequency of this form of psychotherapy are not well defined and hence this treatment modality was not rated in our study.
We also defined two indicators to assess the use of ROM, which where specific for the local programs of care. The indicators examine whether patients are measured during the diagnostic phase and during the first phase of treatment to assess the effectiveness of their treatment.
The treatment adherence score was the sum of the indicators and higher scores reflected better adherence. For patients receiving pharmacotherapy or psychotherapy the maximum score was six points and patients receiving a

combination of pharmacotherapy and psychotherapy the maximum score was eight points.

Potential baseline predictor variables

Demographic variables were obtained using a self-report questionnaire that assessed ethnic background, education, marital status, housing situation and employment status. A Dutch ethnic background was assumed when the patient and both parents were born in The Netherlands. 'Other ethnicity' was scored when these criteria were not fulfilled.

The Brief Symptom Inventory (BSI) is a short version of the Symptom Check List (SCL-90), a self-report instrument that assesses psychopathological symptoms in several domains, e.g. somatic symptoms, depressive symptoms, anxiety symptoms and hostility. The reliability of the BSI has shown good internal consistency and had test-retest reliability coefficients ranging from .68 to .91. The convergent validity has proven to be very good [37].

Generic health status was assessed with the Dutch version of the Short Form 36 (SF-36), a 36 item self-report questionnaire that measures health status in eight domains. The SF-36 has been shown good validity and reliability, with mean alpha of 0.84 across subscales [39].

Data collection and Assessment

Data on the first treatment step were available from ROM and additional data were collected by a manual-based retrospective chart review to include patients that fulfilled the inclusion-criteria (by the first author). Relevant data were entered in a database and the eight indicators were listed on a form and were rated 1 if the criteria were met and 0 if not. To assess inter-rater reliability a random replicate sample of 30 medical records was assessed by two psychiatrists and showed a good inter-rater reliability (kappa >0.8). Anonymity was maintained, and data were used only in aggregate form: accordingly, the participating institute did not require the patient's consent to the use of these data. The institute's medical ethical committee approved the study protocol.

Statistical analyses

Because of the different maximum scores between the treatment modalities, z-scores (i.e, standardized scores with standard deviation units) were calculated, within each treatment modality, for the guideline adherence, which enabled us

to combine the total scores of the three different treatment modalities as the dependent variable. Guideline adherence was subsequently categorized into three categories (i.e., high, greater than 0.6; intermediate ranging from 0.6 to -0.1; and low smaller than -0.1)

For BSI and SF-36 variables medians with interquartile ranges (i.e., 25th and 75th percentiles) are presented and group differences were tested with the non-parametric Kruskal-Wallis Test, as some of the subscales had skewed distributions. Chi-squared tests were used to compare categorical variables and analysis of variance to compare continuous measures between the three categories of guideline adherence. The variables that were associated with guideline adherence in univariate analysis were combined in a multivariable logistic regression model, in which sex, age and ethnic background were forced into the model as covariates. Significance level was set at *P*-value<0.05. Data were analyzed using SPSS version 17.0 statistical software.

Results

Sample and demographic data

Patient characteristics of the 192 patients in our study are presented in Table 1. A total of 67.7% of the 192 subjects was female. The mean age was 36.8 years (SD 11.6). The majority of patients was treated with psychotherapy (47.4%), followed by pharmacotherapy (37.5%), whereas a smaller group was treated with a combination of pharmacotherapy and psychotherapy (15.1%). The male/female ratio and mean age were not different between the treatment modalities. No other statistical significances were found for demographic characteristics.

Univariable correlates of low adherence

Tables 2 and 3 show the univariable correlates of adherence. The low-adherence group displayed a significantly lower score on the SF-36 subscales "social functioning" *(p*-value 0.03) and "vitality" *(p*-value 0.02). No significant differences were found within socio-demographic variables between the adherence groups. The scores on the BSI self-report subscales and the total scale were distributed equally over the adherence groups. No differences in comorbidity were found between the categories of adherence.

Multivariable correlates of low adherence

Odds ratios (OR) for the potential baseline predictive variables of low levels of adherence versus intermediate and high levels of adherence are shown in table 4. Sex and age were not independently associated with low adherence. An independent risk factor for low adherence included the SF-36 subscale of low *vitality* (OR per 10 units increase in vitality=1.34, 95% confidence interval [CI]: 1.06-1.71). In post-hoc analysis, this lower risk associated with vitality seemed to be mainly driven by the strongest impact in the patients receiving psychotherapy (data not shown).

Figure 1 shows the association between the vitality subscale of the SF- 36 and guideline adherence. The results suggest that a vitality score ≥50 is associated with an increased risk of low adherence.

Discussion

In this study we wanted to examine the clinical and psychosocial correlates of adherence to guidelines across diagnoses. We identified an independent predictor for low guideline-adherence in a retrospective cohort of 192 outpatients with mood, anxiety or somatoform disorders who started an acute phase treatment in three consecutive years from 2004 through 2006. A significant independent risk factor for low adherence was a low score on the SF-36 subscale *vitality*. We also found that socio-demographic variables and scores on the BSI did not explain differences between the adherence groups. Since there are a limited number of studies that use psychometric- and socio-demographic data to establish patient factors affecting guideline concordant therapy in mental health, our findings add to the existing literature.

Low vitality scores on the SF-36 predisposed for low adherence to guidelines. Patients with low scores on this subscale report to feel tired and worn out all the time. This lack of energy could interfere with several indicators assessing adherence like meeting appointments for routine outcome monitoring, endurance of pharmacotherapy and to put up with the frequency of psychotherapy. Post hoc analysis showed that patients receiving psychotherapy and displaying low vitality scores were at the highest risk to receive low guideline-concordant care. This is not surprising as psychotherapy is a treatment modality that requires a substantial amount of physical and

emotional effort: weekly sessions, homework, and confrontation with personal limitations.[44] Overlapping constructs like apathy and a lack of motivation have been established before as barriers to treatment with psychotherapy.[45] A clinical implication of our finding might be that patients with low scores on vitality, for example a score of ≥ than 50, may benefit more from an initial treatment with pharmacotherapy than psychotherapy. Such a hypothesis however needs to be confirmed in intervention trials, which may show that treatment success of pharmacotherapy versus psychotherapy is moderated by baseline levels of vitality.

In contrast to other studies [25-34] we did not find an association between socio-demographic variables and comorbidity versus adherence. This lack of relationship may be explained by a lack of power (because of our relatively small sample size) or by the fact that we studied a naturalistic sample, in which socioeconomic differences showed limited variability.

We also found that the scores on the BSI did not explain the differences between the adherence groups. This finding suggests that severity and pattern of the symptoms do not influence adherence to guidelines and is in line with a study that focused on the association between a performance measure variable and the Brief Psychiatric Rating Scale in 116 patients with schizophrenia during 6 months of follow-up. [16]

Literature on the association between compliance to therapy in general and psychometrically assessed patient characteristics is scarce. One study found the Goldberg Depression and Anxiety scales to be predictive for adherence to a web based cognitive behaviour therapy for adolescents who applied for an online depression and anxiety intervention program. [31] Another study assessed adherence among liver transplant candidates using several psychometric instruments. Adherence positively correlated with some personality traits (e.g., agreeableness) and coping strategies (e.g., planning). [46] Psychiatric outpatients with various disorders were assessed with the Brief Psychiatric Rating Scale (BPRS), the Mini Mental State Examination (MMSE) and the Global Assessment of Functioning (GAF) to examine correlates of poor medication adherence amongst psychiatric outpatients, but no association was established. [26] In general it has been demonstrated that as many as half of all patients do not adhere closely to their assigned treatment, resulting in avoidable costs and negative effects on outcomes and quality of life. These results call for greater use of proven screening and assessment tools to identify

and target the patients who are at the greatest risk for low or non-adherence, in order for preventive measures to be taken. [4]

Strengths of this study are the routine outcome assessments by specially trained research nurses and the fact that this population reflects a naturalistic treatment-seeking population in psychiatric care. Our study also has several limitations. First, the sample consisted of 192 patients, which is a relative small sample. A substantial proportion (36%) of the initial sample did not have a baseline ROM assessment due to language problems or logistical reasons. Second there was no reliable information available about somatic comorbidity. Finally, this study focuses on patient factors influencing guideline adherence, whereas adherence is the outcome of a complex interplay between patients, therapists and organizational characteristics. [36]

Conclusions

We conclude that low scores on the SF-36 subscale vitality is a significant risk factor for low adherence to guidelines. Understanding the factors that affect successful treatment adherence may help to improve long-term outcomes as adherence is a major problem in clinical practice. Future studies should focus on larger samples and broader sets of psychometric instruments to develop reliable profiles associated with patients that are at risk to fail guideline-concordant therapy.

Acknowledgments
This study was supported by Rivierduinen, a regional mental health care provider in the
Netherlands. The authors thank the employees of outpatient clinic *Rijnveste* (Leiden) for their cooperation.
Disclosures: none for any author

References

1. Adli M, Bauer M, Rush AJ: Algorithms and collaborative-care systems for depression: Are they effective and why? A systematic review. Biological Psychiatry 59:1029-1038, 2006.
2. Dennehy EB, Suppes T, Rush AJ, et al: Does provider adherence to a treatment guideline change clinical outcomes for patients with bipolar disorder? Results from the Texas Medication Algorithm Project. Psychological Medicine 35:1695-1706, 2005.
3. Bauer MS: A review of quantitative studies of adherence to mental health clinical practice guidelines. Harvard Review of Psychiatry 10:138-153, 2002.
4. Cutler DM, Everett W: Thinking outside the pillbox--medication adherence as a priority for health care reform. N Engl J Med 362:1553-1555, 2010.
5. Bollini P, Pampallona S, Nieddu S, et al: Indicators of conformance with guidelines of schizophrenia treatment in mental health services. Psychiatric Services 59:782-791, 2008.
6. Busch AB, Huskamp HA, Landrum MB: Quality of care in a medicaid population with bipolar I disorder. Psychiatric Services 58:848-854, 2007.
7. Busch SH, Leslie D, Rosenheck R: Measuring quality of pharmacotherapy for depression in a national health care system. Medical Care 42:532-542, 2004.
8. Charbonneau A, Rosen AK, Owen RR, et al: Monitoring depression care - In search of an accurate quality indicator. Medical Care 42:522-531, 2004.
9. Falloon IRH, Economou M, Palli A, et al: The clinical strategies implementation scale to measure implementation of treatment in mental health services. Psychiatric Services 56:1584-1590, 2005.
10. Farrelly N, Dibben C, Hunt N: Current management of bipolar affective disorder: Is it reflective of the BAP guidelines? Journal of Psychopharmacology 20:128-131, 2006.
11. Fortney J, Rost K, Zhang ML, et al: The relationship between quality and outcomes in routine depression care. Psychiatric Services 52:56-62, 2001.
12. Gonzalez HM, Vega HM: Depression Care in the United States Too Little for Too Few. Arch Gen Psychiatry 67:37-46, 2010.
13. Kolla NJ, Links PS, MeMain S, et al: Demonstrating Adherence to Guidelines for the Treatment of Patients With Borderline Personality Disorder. Canadian Journal of Psychiatry-Revue Canadienne de Psychiatrie 54:181-189, 2009.
14. Lim PZ, Tunis SL, Edell WS, et al: Medication prescribing patterns for patients with bipolar I disorder in hospital settings: adherence to published practice guidelines. Bipolar Disorders 3:165-173, 2001.
15. Lloyd AJ, Harrison CL, Ferrier IN, et al: The pharmacological treatment of bipolar affective disorder: practice is improving but could still be better. Journal of Psychopharmacology 17:230-233, 2003.
16. Owen RR, Thrush CR, Kirchner JE, et al: Performance measurement for schizophrenia: adherence to guidelines for antipsychotic dose. International Journal for Quality in Health Care 12:475-482, 2000.
17. Schneider F, Harter M, Brand S, et al: Adherence to guidelines for treatment of depression in in-patients. British Journal of Psychiatry 187:462-469, 2005.
18. Sernyak MJ, Dausey D, Desai R, et al: Prescribers' nonadherence to treatment guidelines for schizophrenia when prescribing neuroleptics. Psychiatric Services 54:246-248, 2003.
19. Stiles PG, Boothroyd RA, Dhont K, et al: Adherence to Practice Guidelines, Clinical Outcomes, and Costs Among Medicaid Enrollees With Severe Mental Illnesses. Evaluation & the Health Professions 32:69-89, 2009.
20. Unutzer J, Simon G, Pabiniak C, et al: The use of administrative data to assess quality of care for bipolar disorder in a large staff model HMO. General Hospital Psychiatry 22:1-10, 2000.
21. Wang PS, Demler O, Kessler RC: Adequacy of treatment for serious mental illness in the United States. American Journal of Public Health 92:92-98, 2002.
22. Weilburg JB, O'Leary KM, Meigs JB, et al: Evaluation of the adequacy of outpatient antidepressant treatment. Psychiatric Services 54:1233-1239, 2003.
23. Weinmann S, Janssen B, Gaebel W: Guideline adherence in medication management of psychotic disorders: an observational multisite hospital study. Acta Psychiatrica Scandinavica 112:18-25, 2005.

24. Young AS, Klap R, Sherbourne CD, et al: The quality of care for depressive and anxiety disorders in the United States. Archives of General Psychiatry 58:55-61, 2001.
25. Achat H, Kawachi I, Spiro A, III, et al: Optimism and depression as predictors of physical and mental health functioning: the Normative Aging Study. Ann Behav Med 22:127-130, 2000.
26. Adewuya AO, Owoeye OA, Erinfolami AR, et al: Prevalence and correlates of poor medication adherence amongst psychiatric outpatients in southwestern Nigeria. Gen Hosp Psychiatry 31:167-174, 2009.
27. Centorrino F, Hernan MA, Drago-Ferrante G, et al: Factors associated with noncompliance with psychiatric outpatient visits. Psychiatr Serv 52:378-380, 2001.
28. Griffith S: A review of the factors associated with patient compliance and the taking of prescribed medicines. Br J Gen Pract 40:114-116, 1990.
29. Leslie DL, Rosenheck RA: Adherence of schizophrenia pharmacotherapy to published treatment recommendations: patient, facility, and provider predictors. Schizophr Bull 30:649-658, 2004.
30. Mohr DC, Ho J, Duffecy J, et al: Perceived barriers to psychological treatments and their relationship to depression. J Clin Psychol 66:394-409, 2010.
31. Neil AL, Batterham P, Christensen H, et al: Predictors of adherence by adolescents to a cognitive behavior therapy website in school and community-based settings. J Med Internet Res 11:e6, 2009.
32. Perlis RH, Ostacher MJ, Miklowitz DJ, et al: Clinical features associated with poor pharmacologic adherence in bipolar disorder: results from the STEP-BD study. J Clin Psychiatry 71:296-303, 2010.
33. Prins MA, Verhaak PF, Smolders M, et al: Patient Factors Associated with Guideline-concordant Treatment of Anxiety and Depression in Primary Care. J Gen Intern Med 2010.
34. Velligan DI, Weiden PJ, Sajatovic M, et al: The expert consensus guideline series: adherence problems in patients with serious and persistent mental illness. J Clin Psychiatry 70 Suppl 4:1-46, 2009.
35. van Fenema EM, van der Wee NJ, Onstein E, et al: [Care programs at mental health centres: the degree of adherence in the first phase of treatment]. Tijdschr Psychiatr 52:299-310, 2010.
36. Francke AL, Smit MC, de Veer AJ, et al: Factors influencing the implementation of clinical guidelines for health care professionals: a systematic meta-review. BMC Med Inform Decis Mak 8:38, 2008.
37. Derogatis L.R.: The Brief Symptom Inventory. Clinical Psychometric Research Baltimore, MD.: 1975.
38. Razavi D, Gandek B: Testing Dutch and French translations of the SF-36 Health Survey among Belgian angina patients. J Clin Epidemiol 51:975-981, 1998.
39. Ware JE, Jr., Sherbourne CD: The MOS 36-item short-form health survey (SF-36). I. Conceptual framework and item selection. Med Care 30:473-483, 1992.
40. Sheehan DV, Lecrubier Y, Sheehan KH, et al: The Mini-International Neuropsychiatric Interview (MINI): The development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10. Journal of Clinical Psychiatry 59:22-33, 1998.
41. Vliet van IM, Beurs de E: Het Mini Internationaal Neuropsychiatrisch Interview (MINI) Een kort gestructureerd diagnostisch psychiatrisch interview voor DSM-IV- en ICD-10-stoornissen. Tijdschrift voor Psychiatrie 49:393-397, 2007.
42. van Kampen D, de BE, Andrea H: A short form of the Dimensional Assessment of Personality Pathology-Basic Questionnaire (DAPP-BQ): the DAPP-SF. Psychiatry Res 160:115-128, 2008.
43. Wollersheim H, Hermens R, Hulscher M, et al: Clinical indicators: development and applications. Netherlands Journal of Medicine 65:15-22, 2007.
44. Craske MG, Roy-Byrne P, Stein MB, et al: CBT intensity and outcome for panic disorder in a primary care setting. Behavior Therapy 37:112-119, 2006.
45. Wiebe E, Greiver M: Using cognitive behavioural therapy in practice: qualitative study of family physicians' experiences. Can Fam Physician 51:992-993, 2005.
46. Telles-Correia D, Barbosa A, Mega I, et al: Adherence correlates in liver transplant candidates. Transplant Proc 41:1731-1734, 2009.

Table 1. Baseline characteristics in the whole group and according treatment modality in 192 patients with mood, anxiety or somatoform disorders

	Total	Psychotherapy	Pharmaco-therapy	Combined therapy	*P*-value*
No. of participants	192	91	72	29	
Sex (n, %):					
• Male	62 (32.3)	24 (26.4%)	29 (40.3%)	9 (31.0%)	0.17
• Female	130 (67.7%)	67 (73.6%)	43 (59.7%)	20 (69.0%)	
Age (yr) - (mean, SD)	36.8 ± 11.6	35.7 ± 11.7	38.7 ± 11.5	35.3 ± 11.5	0.21
Ethnic background (n, %):					
• Dutch	141 (73.4%)	65 (71.4%)	53 (73.6%)	23 (79.3%)	0.70
• Other Ethnicity	51 (26.6%)	26 (28.6%)	19 (26.4%)	6 (20.7%)	
Marital status (n, %):					
• Married/living with partner	101 (52.6%)	41 (45.1%)	41 (56.9%)	19 (65.5%)	0.10
• Unmarried	91 (47.4%)	50 (54.9%)	31 (43.1%)	10 (34.5%)	
Educational status (n, %):					
• Lower education	86 (44.8%)	34 (37.4%)	40 (55.6%)	12 (41.4%)	0.06
• Higher education	106 (55.2%)	57 (62.6%)	32 (44.4%)	17 (58.6%)	
Employment status (n, %):					
• Employed	90 (46.9%)	42 (46.2%)	34 (47.2%)	14 (48.3%)	0.89
• Unemployed/retired	47 (24.5%)	20 (22.0%)	19 (26.4%)	8 (27.6%)	
• Work-related disability	55 (28.6%)	29 (31.9%)	19 (26.4%)	7 (24.1%)	

Data are presented as n (%) or mean (± SD), when appropriate.
*: P-value by chi-squared test (for categorical variables) or ANOVA (for age).

Table 2. Baseline demographic and treatment characteristics according to treatment adherence in 192 patients with mood, anxiety or somatoform disorders

	Tertiles of guideline adherence			
	High	Intermediate	Low	*P* for trend*
No. of participants (%)	57 (29.7%)	83 (43.2%)	52 (27.1%)	
z-score (range)	> 0.6	0.6 to -0.1	< -0.1	–
Sex (n, %):				
• Male	17 (29.8%)	26 (31.3%)	19 (36.5%)	0.46
• Female	40 (70.2%)	57 (68.7%)	33 (63.5%)	
Age (yr) - (mean, SD)	38.8 ± 11.0	36.7 ± 11.4	34.6 ± 12.4	0.06
Ethnic background (n, %):				
• Dutch	47 (82.5%)	56 (67.5%)	38 (73.1%)	0.25
• Other Ethnicity	10 (17.5%)	27 (32.5%)	14 (26.9%)	
Marital status (n, %):				
• Married/living with partner	28 (49.1%)	46 (55.4%)	27 (51.9%)	0.76
• Unmarried	29 (50.9%)	37 (44.6%)	25 (48.1%)	
Educational status (n, %):				
• Lower education	27 (47.4%)	31 (37.3%)	28 (53.8%)	0.53
• Higher education	30 (52.6%)	52 (62.7%)	24 (46.2%)	
Employment status (n, %):				

Table 2. continued

	Tertiles of guideline adherence			
	High	**Intermediate**	**Low**	***P* for trend***
• Employed	30 (52.6%)	36 (43.4%)	24 (46.2%)	0.26
• Unemployed/retired	14 (24.6%)	23 (27.7%)	10 (19.2%)	
• Work-related disability	13 (22.8%)	24 (28.9%)	18 (34.6%)	
Treatment modality (n, %):				
• Psychotherapy	38 (66.7%)	26 (31.3%)	27 (51.9%)	0.27
• Pharmacotherapy	11 (19.3%)	43 (51.8%)	18 (34.6%)	
• Combined therapy	8 (14.0%)	14 (16.9%)	7 (13.5%)	

Data are presented as n (%), median (range) for z-score of guideline adherence, and mean ± SD for age.
*: *P*-value by chi-squared test for linear-by-linear trend, or by ANOVA for weighted linear term.

Table 3. Baseline disease characteristics according to treatment adherence in 192 patients with mood, anxiety or somatoform disorders

	Tertiles of guideline adherence			
	High	**Intermediate**	**Low**	***P* value***
No. of participants	57	83	52	
Brief Symptom Inventory (BSI):				
• Somatisation	1.00 (0.50-1.43)	0.86 (0.43-1.57)	0.64 (0.29-1.29)	0.26
• Obsession-Compulsion	1.33 (0.83-2.25)	1.33 (0.83-2.50)	1.42 (0.83-1.96)	0.87
• Interpersonal Sensitivity	1.00 (0.63-2.00)	1.00 (0.50-2.00)	1.13 (0.75-2.25)	0.61
• Depression	1.33 (0.67-2.33)	1.50 (0.83-2.50)	1.50 (0.67-2.25)	0.48
• Anxiety	1.17 (0.83-1.83)	1.17 (0.67-2.17)	1.17 (0.67-1.83)	0.83
• Hostility	0.60 (0.20-1.20)	0.80 (0.20-1.40)	0.80 (0.20-1.75)	0.59
• Phobic anxiety	1.00 (0.50-1.60)	0.80 (0.40-2.00)	0.80 (0.40-1.35)	0.60
• Paranoid ideation	0.60 (0.20-1.80)	0.80 (0.20-2.00)	1.00 (0.40-1.75)	0.89
• Psychoticism	1.00 (0.50-1.40)	1.00 (0.60-1.60)	1.00 (0.40-1.60)	0.88
• Total score	1.09 (0.78-1.52)	1.11 (0.72-1.92)	1.19 (0.74-1.66)	0.91
Health Status Questionnaire (SF-36):				
• Physical functioning	75 (50-95)	80 (55-95)	85 (66-95)	0.56
• Role limitations due to physical problems	0 (0-75)	25 (0-50)	25 (0-69)	0.85
• Bodily pain	67 (45-90)	65 (45-90)	67 (45-100)	0.75
• General health perceptions	50 (35-60)	50 (35-65)	50 (40-69)	0.62
• Vitality	35 (20-43)	30 (20-40)	38 (25-55)	**0.02**
• Social functioning	38 (25-63)	38 (25-63)	63 (38-63)	**0.03**
• Role-limitations due to emotional problems	33 (0-50)	0 (0-33)	33 (0-67)	0.17
• Mental health	40 (30-52)	40 (28-52)	40 (32-60)	0.83
Comorbidity:				
• No comorbid psychiatric disorders	28 (30.8%)	27 (37.5%)	6 (20.7%)	0.48
• One comorbid psychiatric disorder	41 (45.1%)	22 (30.6%)	15 (51.7%)	
• > One comorbid psychiatric disorder	22 (24.2%)	23 (31.9%)	8 (27.6%)	

Data are presented as median (interquartile range) or no. (%).
*: *P*-value by chi-squared test for linear-by-linear trend, or by Kruskal-Wallis Test, when appropriate.

Tabel 4. Independent odds ratio's for low adherence versus high and intermediate adherence in 192 patients with mood, anxiety or somatoform disorders

	No.	High and Intermediate (reference)	Odds ratio for low adherence (95% CI)	*P*-value
No. of participating patients		140	52	
Sex:				
• Male	62	1.0		
• Female	130	1.0	1.22 (0.60-2.48)	0.59
Age (yr):	192	1.0	0.98 (0.95-1.01)	0.12
Treatment modality:				
• Psychotherapy	91	1.0		
• Pharmacotherapy	72	1.0	1.02 (0.48-2.16)	0.96
• Combined therapy	29	1.0	0.68 (0.25-1.86)	0.45
Health Status Questionnaire (SF-36):				
• Vitality*	192	1.0	**1.34 (1.06-1.71)**	**0.02**
• Social functioning*	192	1.0	1.06 (0.91-1.23)	0.44

SF-36 indicates the Short-Form 36 Health Status Questionnaire; CI, confidence interval.
Odds ratios were calculated with a multivariable logistic regression model.
Higher scores on subscales of the SF-36 indicate a higher severity.
*: Odds ratios for are shown for the increase per 10 units increase in vitality and social functioning score.

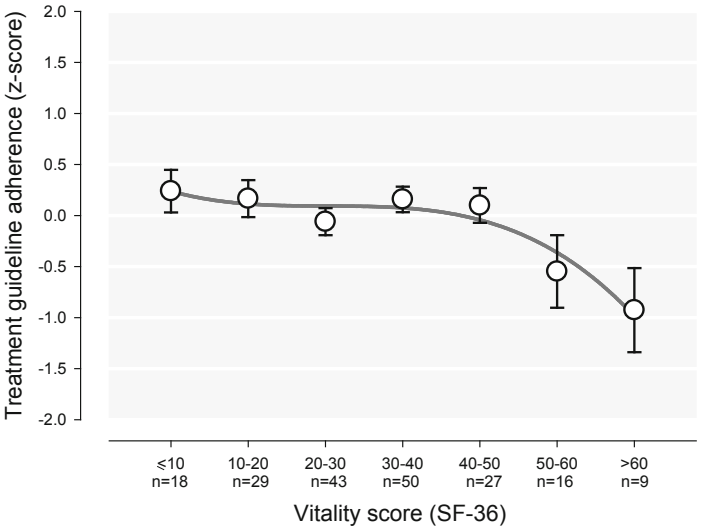

Figure 1. Association between vitality subscale of the Short-Form 36 (SF-36) and treatment guideline adherence in 192 patients with a mood, anxiety or somatoform disorder. Means are presented (with bars representing standard errors), and a third order regression line. The results suggest that a vitality score ≥50 (indicative of low vitality) is associated with an increased risk of non-adherence.