Chapter 7

Assessing adherence to guidelines with administrative data in psychiatric outpatients

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Journal of Evaluation in Clinical Practice, June (2015) 1-9

Abstract

Objective: to assess (feasibility) of adherence to treatment guidelines among outpatients with common mental disorders in a routine Dutch clinical outpatient setting for common mental disorders using administrative data.

Methods: in a retrospective cohort study, we analyzed routinely collected administrative data of 5346 patients who were treated for mood, anxiety or somatoform disorders with pharmacotherapy, psychotherapy or a combination of both treatment modalities. The available administrative data allowed assessment of guideline adherence with a disorder-independent set of five available quality indicators, assessing psychotherapy, pharmacotherapy, a combination of both and routine outcome measurements (ROM) during diagnostic and therapeutic phases. We also examined associations between the sociodemographic variables age, gender and primary diagnosis, on the one hand and non-adherence to guidelines were tested using logistic regression analysis.

Results: patients were aged 39.5 years (SD 13.0) on average. The majority of patients were treated with a combination of pharmacotherapy and psychotherapy (50.1%), followed by psychotherapy (44.2%) and a pharmacotherapy (5.6%). The majority of patients were suffering from a mood disorder (50.0%), followed by an anxiety (43.9%) and somatoform disorders (6.1%). A diagnosis of anxiety or somatoform disorder was associated with higher odds of suboptimal duration (odds ratio [OR]: 1.55 and 1.82) and suboptimal frequency of psychotherapeutic treatment (OR of 0.89 and 0.63), and absence of ROM in the diagnostic phase (ORs 1.31 and 1.36, respectively) compared to depressive disorder disorders. No ROM in the diagnostic phase was also predicted for by increasing age (ORs for the age categories of 56 and older of 1.48).

Conclusions: in this proof of principal study, we were able to assess some key indicators assessing adherence to clinical guidelines by using administrative data. Also, we could identify predictors of adherence with simple parameters available in every administrative data. Administrative data could help to monitor and aid guideline adherence in routine care, although quality may vary between settings.

Introduction

In mental health care, as in other branches of medicine, evidence-based guidelines have been developed as basis for treatment in clinical practice. The results of daily patient care are supposed to improve when the guidelines are followed. Whether this expectation comes true, can only be evaluated if in clinical practice not only treatment outcome is assessed, but also compliance with the guidelines is taken into account. Methods to assess treatment outcome are widely used in randomized controlled clinical trials as well as in clinical practice, but show important differences between these settings. Clinical trials more often rely on lengthier and frequently administered measurements, which are usually clinician- or observer-rated. In clinical practice, measurements are typically briefer, free or low costs, based on patient self-report, use relatively simple scoring and have a lower frequency. In contrast to outcome assessment, methods to assess guideline adherence in mental health care are typically less developed, especially in routine clinical practice, and research in this field is still limited. Nevertheless, some trends can be identified in the available literature.

So far, most studies on guideline adherence in mental health have focussed on a single disorder, for instance major depressive disorder, bipolar disorder or schizophrenia[1-4] and only a few studies looked at comorbidity, like the combination of a depressive and anxiety disorder [5-7]. In general, studies focussed on one treatment modality, mostly pharmacotherapy, with only a few studies examining adherence in combination therapy of pharmacotherapy and psychotherapy and seldom in psychotherapy alone. Also, the number of indicators used to assess adherence varied between studies, ranging from one to 49 [6-30].

With regard to indicators of adherence in pharmacotherapy in clinical practice, a frequently used indicator, and often the only one, is adequate duration of pharmacotherapy, usually set a minimum of six weeks. In most studies around 50% of the delivered pharmacotherapies met this criterion for an adequate duration [3,31-34].

For psychotherapies, adherence to guidelines is usually operationalized with the indicators, duration of therapy and frequency of the therapeutic sessions. Based on these indicators on average, one third of the patients seem to receive psychotherapy according to guidelines [3,31,35].

Next to the standards for pharmacotherapy and psychotherapy, most guidelines also stress the importance of standardized assessment of symptom severity and psychosocial functioning in the diagnostic phase and at the end of the each treatment period (American Psychiatric Association, British Association for Psychopharmacology, Agency for Healthcare Research and Quality). This standardized outcome measurement can be considered another important element of adherence to guidelines, Remarkably, so far there are only very limited data available on adherence in outcome measurements [36].

In previous studies we developed a generic set of quality measures (indicators) to assess the implementation of guidelines in daily practice. This set was tested in a retrospective cohort study in a randomly selected sample of 300 Dutch outpatients who started an acute phase psychiatric treatment for common psychiatric disorders, i.e. depression, anxiety and somatoform disorders. Patients were treated with pharmacotherapy, psychotherapy or a combination of both, in a setting with routine outcome measurement at baseline and follow-up [37,38]. Contrary to most other studies, we did not use administrative data, but chose to use clinical data that were extracted manually from a sample of written and electronic patient records. This proved to be very labour intensive and not suited for routine assessment of adherence in our specific setting at that time. It should be noted, however, that in other settings, such as the Veteran Health Administration, medical record reviews to obtain specific quality measures are done routinely [39].

Using our previously developed set of quality indicators, we found that scores on most indicators showed that treatments in routine clinical practice setting were delivered according to the guidelines, but patients receiving a combination of psychotherapy and pharmacotherapy were more less likely to receive guideline-concordant care than patients receiving psychotherapy, whose treatment showed the best results on the indicators. Overall, only a minority of the patients in this sample was treated in complete accordance with the guidelines, with high scores on all indicators [40]. In different cross-diagnostic studies, overall adherence rates are also low, around 20-25% [7,17].

Clearly, it is clinically relevant to identify patients at risk for low adherence as early as possible, as these patients may require additional interventions to prevent worse outcome. Specific characteristics of patients (but also of therapists and settings) may all influence adherence. So far, only a few studies have looked at patient characteristics predicting rate of adherence and found that age and

gender were associated with the adherence rate on specific indicators [3,32]. Adequate duration of pharmacotherapy was found for instance to be more likely in older females [32]. At the same time, another study found that higher age was associated with insufficient assessment of therapy outcomes during treatment [36]. To the best of our knowledge the influence of diagnosis on guideline adherence has not be assessed before.

In the present study we examined whether and to what extent we could use the data gathered routinely in our setting for financial and administrative purposes, to assess guideline adherence to a similar level as with the detailed reviewing of medical records. The data from this Psygis register became accessible for research only recently. In addition, we also aimed to further explore the predictive value for guideline adherence of the patient characteristics age, gender and diagnosis, simple parameters we assume to be typically available in every routinely collected hospital administrative data set.

Material and methods

Study setting

Rivierduinen is a regional mental health care provider (RMHCP) in the Netherlands, providing secondary mental health care for an area with over one million inhabitants. The use of evidence based guidelines and outcomes measurement is integrated in routine practice in Rivierduinen. The implementation of guidelines and a system for Routine Outcome Monitoring (ROM) started in 2002, in collaboration with the department of psychiatry of the Leiden University Medical Hospital [41]. Under the Dutch 'Medical Research Involving Human Subjects' Act (WMO), analyses of data from the Psygis Register did not require approval by the local medical ethics committee.

Guidelines

The Dutch guidelines for diagnosis and treatment of many psychiatric disorders have been formulated by the Dutch Association of Psychiatry, mostly in association with the Associations of Psychology and of General Practitioners. (www.trimbos.nl , www.nvvp.net) The stepped care-based programs of Rivierduinen followed the national evidence-based 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 depression, anxiety and somatoform disorders and describe which treatment modality, form and frequency of psychotherapy and, in the case of pharmacotherapy, which psychotropic drugs 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 behavioural 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 and data collection

We had access to a large database of patient data gathered routinely in the hospital for financial and administrative purposes. The Psygis database provides information on a limited set of parameters: age and sex of the patients, the principal diagnosis in DSM-IV codes as established by a clinician during the intake phase, the type of treatment, the duration of treatment based on the first and last visit registered for the treatment, and number of visits. Also, ROM assessments are registered.

We selected patients between 18 and 65 years old, with a DSM-IV depressive, anxiety or somatoform disorder as primary diagnosis and of whom a first therapeutic visit was registered between January 2009 through April 2013. Patients were allowed to have other, secondary, diagnoses that were not the focus of treatment. The 5346 patients fulfilling these criteria were categorized into three therapeutic groups, based on the presence of an administrative code indicating psychotherapy, pharmacotherapy or both.

Indicators

We used indicators to assess guideline adherence for the baseline assessment and the first treatment phase, i.e. the first 12 weeks after the first registered therapeutic visit. For our previous studies [37,38] a consensus panel of senior psychiatrists from RMHCP Rivierduinen and the department of psychiatry of the LUMC identified, based on the guidelines, developed eight indicators that

can be applied to mood, anxiety as well as somatoform disorders: 1) treatment is in accordance with the primary diagnosis; 2) the stepped care principle was followed, and, in case of pharmacotherapy: 3) at least the minimum antidepressant dose was prescribed and 4) duration of pharmacotherapy was at least six weeks, and, in case of psychotherapy: 5) duration was of at least twelve weeks and 6) the frequency was at least one session every 1.5 weeks. As indicators for the application of ROM we used the presence of a ROM assessment 7) during the diagnostic phase and 8) at the end of the first treatment phase. For a more detailed description see Fenema et al. [37].
In the administrative hospital data used in this study there was no information available for the indicators 1,2 and 3. Fortunately, data on the remaining five indicators (4 -8) could be extracted from the data. With respect to indicator 4 we used the date of the first and the last pharmacotherapy visit to estimate the duration of pharmacotherapy. With respect to indicator 5 we did the same for psychotherapy visits. The frequency of psychotherapy visits was estimated by dividing indicator 5 by the number of psychotherapy visits. For this study we chose an average of one session every two weeks as minimal required frequency as this more adequately reflected the minimal frequency as demanded by guidelines. A patient treated with both pharmacotherapy and psychotherapy was assessed for both treatment modalities separately. Both ROM indicators (7 and 8) were also assessed.

Predictors

We used three independent baseline predictors that were available for all subjects in the database and that might exert a relevant influence on the adherence to guidelines: age, gender [3,32] and diagnosis (depression, anxiety or somatoform disorders. Age was classified in four categories: ≤25 years, 26-40 years, 41-55 years and >56 years of age.

Statistical analyses

Categorical data are presented as number (percentage) and were compared among groups using chi-squared tests. Continuous data are presented as mean (standard deviation [SD]) and compared among groups using t-tests for independent samples. Logistic regression analysis was used to test for the independent predictors for the non-compliance to each of the five disorder-independent indicators, yielding odds ratios (with their accompanying 95%

confidence intervals [CI]). A p-value of < 0.05 was considered statistically significant. Given the exploratory nature of the study, results are presented uncorrected. Data were analysed using the SPSS 20.0 software.

Results

Sample and demographic data

Patient characteristics are presented in Table 1. A total of 60.8% were female and the mean age was 39.5 years (SD 12.6). The majority of patients were treated with a combination of pharmacotherapy and psychotherapy (50.1%) and the majority was suffering from a mood disorder (50.0%). ROM was performed in in 35.9% of the patients in the diagnostic phase and 31.4% in the treatment phase. We selected patients based on their primary diagnosis and there was no reliable information available on comorbidity, as sometimes extra diagnoses were registered and sometimes not.

Scores on the indicators and predictors

Pharmacotherapy (PhT). For the 2981 patients receiving pharmacotherapy (alone or as combination therapy), treatment duration was at least 6 weeks in 93.9% of the cases. From the small group of 300 patients receiving only pharmacotherapy, only 66.0% was treated for an adequate duration of at least 6 weeks.

For this indicator (duration of pharmacotherapy) we found no significant independent baseline predictors for the sample with 2981 patients (see table 2). The pharmacotherapy only group was too small to use in multivariate analyses.

Psychotherapy (PsT). For the 5046 patients receiving psychotherapy treatment duration was at least 12 weeks in 82.9% of the patients. As shown in table 3 differences in age and gender did not predict treatment duration for psychotherapy. Compared to the patients suffering from major depressive disorder MDD, patients with anxiety disorders and somatoform disorders had increased odds of duration of psychotherapeutic treatment less than 12 weeks (OR of 1.55 and 1.82, respectively, Ps < 0.001 for both).

Of the 5046 patients, 30.4% received a psychotherapeutic session at least every two weeks. As shown in table 4, age and gender did not predict treatment frequency. Compared to patients with MDD, patients with anxiety or somatoform disorders had more chance to receive psychotherapy at least every two weeks. (OR of 0.89 and 0.63, respectively, P=0.048 and <0.001 respectively). These two patient groups thus received shorter psychotherapeutic treatment, but more frequent psychotherapeutic sessions (tables 3 and 4).

ROM. Of the 5346 patients included in the study, 35.9% received a diagnostic ROM assessment at baseline. Table 5 shows that compared to patients with younger ages (i.e., ≤ 25 yrs.), older patients were more at risk of not having a ROM assessment in the diagnostic phase. This risk increased with age: ORs for the age categories of 26 through 40, 41 through 55 and 56 and older were 1.16, 1.45 and 1.48, respectively (P< 0.001 for linear trend over all four categories). ROM during the diagnostic phase was more often not administered in patients suffering from anxiety or somatoform disorders (ORs 1.31 and 1.36, respectively) compared to depression.
Of the 5346 patients in the study, in only 31.4% ROM assessments during treatment were carried out (table 6). Having had no ROM during the diagnostic phase is was the sole independent predictor of having no ROM in the therapeutic phase (OR 4.5; *P*<0.001).

Discussion

In the present study we examined whether and to what extent we could assess guideline adherence based on data from an administrative database used by many Dutch mental health providers and which became recently available for analysis in our region. In addition, we also wanted to further explore whether guideline adherence was influenced by the patient characteristics age, gender and diagnosis.
Contrary to our expectations, the database allowed us only to assess adherence on five (i.e., duration of pharmacotherapy or psychotherapy, frequency of psychotherapy, ROM at baseline and during follow-up) of the eight indicators we used in our previous study with patient files, and for some of these we had to use estimates [37,38]

Our investigations of the influence of patient characteristics showed that in particular younger patients with a depressive disorder had a higher chance to receive ROM, both in the diagnostic and therapeutic phase. Further, patients with an anxiety disorder were less likely to be measured during the course of their treatment. Having no ROM during the intake independently predicted for the absence of ROM during the therapeutic phase.
We found different adherence rates on the five available indicators. Duration of pharmacotherapy and psychotherapeutic treatment showed high adherence rates of almost 94 and 83% respectively, and frequency of psychotherapeutic sessions and ROM assessment remained around an adherence rate of 30%. In patients with a depressive disorder the adherence rates for the minimum adequate duration of psychotherapy were the best, but scores on the indicator on adequate frequency of psychotherapeutic treatment were low.
It is not straightforward to compare our results with the results from previous literature as the approaches, quality and structure of the databases vary between studies. Most studies using administrative data to assess guideline adherence focused on one single disorder, mainly depression, and focussed on pharmacotherapy with indicators like prescription of pharmacotherapy, adequate dosage of pharmacotherapy and number and frequency of visits. Unfortunately, contrary to many other databases, described the literature our database did not provide information on the (minimum) dosage of pharmacotherapy [1-18,32-36,42-52]. In our study, adequate duration of pharmacotherapy treatment was found in almost 94% of the cases, which is much higher than that of around 50% found in most other studies using administrative data [3,31,33,34]. The results on this indicator might be influenced by the fact that the group of patients receiving only pharmacotherapy was relatively small compared to the two other treatment modalities. This might be due to the organisation of the Dutch mental health system, were more complex cases, usually requiring combination therapy, are treated in secondary and tertiary care settings.

Our results on the indicators measuring adherence to the guidelines for psychotherapy are more in line with the literature, where the average score is around 30% based on the assessment of both duration and frequency of the provided psychotherapy [3,31,35].

Although standardized assessment of treatment is considered a key element of treatment in Dutch guidelines, we found that only around one third of the patients were measured during the diagnostic and therapeutic phase. The low adherence rate is remarkable because in recent years ROM has been a focus of attention, as insurance companies have made benchmarking compulsory in Dutch mental health care. Literature assessing adherence to routine measurement is scarce. A Swedish implementation study assessed comparable indicators of ROM and found higher adherence rates of around 50% and 80%, but these higher proportions were only reached after active implementation strategies [36].

The limited administrative data did not allow us to assess adherence on the same number of indicators and as detailed as in our previous study [37,38] that was based on medical record reviewing. However, the results on the available indicators seem in general to be remarkably in line with the results of our previous study that was based on detailed reviewing of medical records.

The utility of administrative data or medical record reviewing for assessing guideline adherence is determined by the quality, detail and accessibility of the data, and the way information can and is allowed to be coupled. Clearly, this varies between different settings, systems and countries. In the literature there are several examples of systems, such as the US Veterans Health Administration were reviewing of (electronic) medical records is done routinely and detailed [39]. Also, several insurance databases provide detailed information on diagnosis and duration and dose of pharmacotherapy. Nowadays, in Dutch mental health settings electronic medical records are used together with systems of routine monitoring. However, routinely extracting data from the medical records and a coupling with ROM and the Psygis database, or other administrative databases, is not yet in place due to technical and legal issues.

In addition to adherence rate, we also aimed to further explore whether guideline adherence in our setting was influenced by the patient characteristics age, gender and primary diagnosis. We found that a diagnosis of depression was associated with higher scores on the indicators 'duration of psychotherapy' and 'ROM at baseline', but lower scores on 'required frequency of psychotherapy', when compared to anxiety and in particular somatoform disorders. This may indicate suboptimal treatment intensity in patients with depression, perhaps due to the fact that patients with depression had a more severe profile, making it more difficult for them to come to appointments. Also, patients

with depression were more likely to receive combination therapy, which may have resulted in more complex appointment schedules. Further research into patient- and therapist factors influencing this adherence indicator is clearly warranted.

Younger age was associated with a better adherence to ROM, both in the diagnostic and therapeutic phase. This is line with the findings from a study by Forsner et al. in BMC Psychiatry [36]. Age did not influence the duration of pharmacotherapy, which is not in line with the results of another study showing that adequate duration of pharmacotherapy was more likely in older, white females [32]. Patients with an anxiety disorder were less likely to be measured during the course of their treatment, perhaps because of faster improvement leading to attrition, or because of the way ROM was organised in the specific outpatient unit were they were treated.

Our study has several limitations. First we could only test a limited amount of indicators based on the available administrative data. Second, important aspects of pharmacotherapy, psychotherapy or the combination therapy, such as the dose or filled prescriptions, were not available in our data. A third limitation is the assessment of duration of treatment, as we have assumed that the administrative duration corresponded with actual treatment duration, but this has not been verified by us. However, given the importance of these administrative data for the reimbursement of mental health providers by health insurances, we believe the data to reflect actual duration to a fair degree. Data on treatment outcomes were not available in the database, so we don't know which patients were in remission and quit their treatment, resulting in a possible attrition bias. Also, the database provided no information on medication dose. Information about a longer follow-up would have been helpful to assess whether stepped care has been respected. Another limitation is the fact that we could not examine the influence of therapy or treatment modalities. In a previous study [40], designed in a different way than the actual study, we did find differences in adherence between treatment modalities. When applying a stringent Bonferroni correction for multiple comparisons, results remain unchanged, except for the frequency of psychotherapeutic sessions. Finally, there was no reliable information on ethnicity. Previous literature shows a significant influence of ethnicity on guideline adherence and sufficient mastery of the Dutch language is a necessary condition for ROM [3,32].

Concluding, in this explorative study examining the feasibility of assessing guideline adherence with administrative data available in our setting, we found that only a limited number of indicators could be assessed, in contrast to other databases described in the literature. Results on the indicators were comparable to those of our previous study where we reviewed medical records. Assessment of guideline adherence in our and other Dutch settings may in the future potentially benefit from methods for routinely extracting data from medical records and a coupling with ROM and the Psygis database.
Further studies need to replicate and further explore our findings of younger age and depression as predictors of better adherence to specific elements of guidelines.

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Table 1. Descriptives of 5346 psychiatric outpatients receiving therapy for a depressive-, anxiety or somatoform disorder

	n	Range	Mean± SD or %
Age (yr)	5346	18-66	39.5 ± 13.0
Female gender	3250 (60.8%)		
Treatment Modality	5346		
• Psychotherapy	2365 (44.2%)		
• Pharmacotherapy	300 (5.6%)		
• Combination	2681 (50.1%)		
Diagnosis	5346		
• Depression	2673 (50.0%)		
• Anxiety	2346 (43.9%)		
• Somatoform	327 (6.1%)		
Treatment Duration (months)	5346	0-49	11.6 ± 10.0
No. of psychotherapy sessions	5046	1-665	19.9 ± 31.2
No. of pharmacotherapy sessions	2981	1-67	7.6 ± 7.6
ROM in diagnostic phase	1917 (35.9%)		
ROM in treatment phase	1681 (30.3%)		

Table 2. Independent baseline predictors of adequate pharmacotherapy (duration) for 2981 psychiatric outpatients

	≥ 6 weeks PhT (n=2798)	**< 6 weeks PhT** (n=183)	**P-value***	**Multivariable odds ratio** (95% CI)	**P-value****
Age (yr):					
• ≤ 25	385 (13.8%)	24 (13.1%)	0.92	Ref.	0.85
• 26 – 40	947 (33.8%)	67 (36.6%)		1.13 (0.69-1.82)	
• 41 – 55	1030 (36.8%)	62 (33.9%)		0.95 (0.58-1.55)	
• > 56	436 (15.6%)	30 (16.4%)		1.08 (0.62-1.89)	
Gender:					
• Female	1602 (57.3%)	96 (52.5%)	0.20	Ref.	0.21
• Male	1196 (42.7%)	87 (47.5%)		1.22 (0.90-1.64)	
Diagnosis					
• Depression	1720 (61.5%)	115 (62.8%)	0.56	Ref.	
• Anxiety	974 (34.8%)	64 (35.0%)		0.98 (0.71-1.35)	0.93
• Somatoform	104 (3.7%)	4 (2.2%)		0.59 (0.21-1.63)	0.30

*: P-value by chi-squared test, linear-by-linear term (for age) and Pearson's term (all other variables).
**: P-value by logistic regression analysis (with P-value for linear trend for age), with all 3 independent variables in the model.

Table 3. Independent baseline predictors of adequate psychotherapeutic treatment (duration) for 5046 psychiatric outpatients

	≥ 12 weeks PsT (n=4181)	**< 12 weeks PsT** (n=865)	**P-value***	**Multivariable odds ratio** (95% CI)	**P-value****
Age (yr):					
• ≤ 25	734 (17.6%)	165 (19.1%)	0.62	Ref.	0.70
• 26 – 40	1429 (34.2%)	289 (33.4%)		0.94 (0.76-1.16)	
• 41 – 55	1426 (34.1%)	284 (32.8%)		0.97 (0.78-1.20)	
• > 56	592 (14.2%)	127 (14.7%)		1.05 (0.81-1.36)	
Gender:					
• Female	2579 (61.7%)	518 (59.9%)	0.32	Ref.	0.19
• Male	1602 (38.3%)	347 (40.1%)		1.11 (0.95-1.29)	
Diagnosis					
• Depression	2133 (51.0%)	345 (39.9%)	< 0.001	Ref.	
• Anxiety	1802 (43.1%)	448 (51.8%)		1.55 (1.33-1.82)	< 0.001
• Somatoform	246 (5.9%)	72 (8.3%)		1.82 (1.36-2.42)	< 0.001

*: P-value by chi-squared test, linear-by-linear term (age) or Pearson term (all other variables).
**: P-value by logistic regression analysis (with P-value for linear trend for age), with all 3 independent variables in the model.

Table 4. Independent baseline predictors of adequate psychotherapeutic treatment (frequency of therapeutic sessions) for 5046 psychiatric outpatients

	PsT at least every 2 weeks (n=1533)	**Less PsT then every 2 weeks** (n=3513)	**P-value***	**Multivariable odds ratio** (95% CI)	**P-value****
Age (yr):					
• ≤ 25	314 (20.5%)	585 (16.7%)	0.33	Ref.	0.52
• 26 – 40	484 (31.6%)	1234 (35.1%)		1.35 (1.13-1.60)	
• 41 – 55	503 (32.8%)	1207 (34.4%)		1.26 (1.05-1.50)	
• > 56	232 (15.1%)	487 (13.9%)		1.10 (0.89-1.35)	
Gender:					
• Female	955 (62.3%)	2142 (61.0%)	0.38	Ref.	0.49
• Male	578 (37.7%)	1371 (39.0%)		1.04 (0.92-1.18)	
Diagnosis					
• Depression	704 (45.9%)	1774 (50.5%)	< 0.001	Ref.	
• Anxiety	705 (46.0%)	1545 (44.0%)		0.89 (0.78-1.01)	0.048
• Somatoform	124 (8.1%)	194 (5.5%)		0.63 (0.49-0.80)	< 0.001

*: P-value by chi-squared test, linear-by-linear term (for age) and Pearson's term (all other variables).
**: P-value by logistic regression analysis (with P-value for linear trend for age), with all 3 independent variables in the model.

Table 5. Independent baseline predictors of ROM during diagnostic phase for 5346 psychiatric outpatients

	ROM in diagnostic phase (n=1917)	**No ROM in diagnostic phase** (n=3429)	**P-value***	**Multivariable odds ratio** (95% CI)	**P-value****
Age (yr):					
• ≤ 25	374 (19.5%)	558 (16.3%)	< 0.001	Ref.	< 0.001
• 26 – 40	683 (35.6%)	1140 (33.2%)		1.16 (0.99-1.37)	
• 41 – 55	605 (31.6%)	1212 (35.3%)		1.45 (1.23-1.71)	
• > 56	255 (13.3%)	519 (15.1%)		1.48 (1.21-1.81)	
Gender:					
• Female	1143 (59.6%)	2107 (61.4%)	0.19	Ref.	0.15
• Male	774 (40.4%)	1322 (38.6%)		0.92 (0.82-1.03)	
Diagnosis					
• Depression	1027 (53.6%)	1646 (48.0%)	< 0.001	Ref.	
• Anxiety	787 (41.1%)	1559 (45.5%)		1.31 (1.16-1.47)	< 0.001
• Somatoform	103 (5.4%)	224 (6.5%)		1.36 (1.06-1.74)	0.01

*: P-value by chi-squared test, linear-by-linear term (for age) and Pearson's term (all other variables).
**: P-value by logistic regression analysis (with P-value for linear trend for age), with all 3 independent variables in the model.

Table 6. Independent baseline predictors of ROM during treatment phase for 5346 psychiatric outpatients

	ROM in treatment phase (n=1681)	**No ROM in treatment phase** (n=3665)	**P-value***	**Multivariable odds ratio** (95% CI)	**P-value****
Age (yr):					
• ≤ 25	313 (18.6%)	619 (16.9%)	0.06	Ref.	0.54
• 26 – 40	579 (34.4%)	1244 (33.9%)		1.05 (0.88-1.26)	
• 41 – 55	560 (33.3%)	1257 (34.3%)		1.03 (0.86-1.24)	
• > 56	229 (13.6%)	545 (14.9%)		1.10 (0.88-1.37)	
Gender:					
• Female	1026 (61.0%)	2224 (60.7%)	0.80	Ref.	0.048
• Male	655 (39.0%)	1441 (39.3%)		1.05 (0.92-1.19)	
Diagnosis					
• Depression	872 (51.9%)	1801 (49.1%)	0.17	Ref.	
• Anxiety	713 (42.4%)	1633 (44.6%)		1.04 (0.92-1.19)	0.51
• Somatoform	96 (5.7%)	231 (6.3%)		1.06 (0.81-1.38)	0.69
ROM in diagnostic phase:					
• Present	1007 (59.9%)	910 (24.8%)			
• Absent	674 (40.1%)	2755 (75.2%)	< 0.001	4.51 (3.99-5.10)	< 0.001

*: P-value by chi-squared test, linear-by-linear term (for age) and Pearson's term (all other variables).
**: P-value by logistic regression analysis (with P-value for linear trend for age), with all 3 independent variables in the model.