Association of treatment satisfaction and psychopathological sub-syndromes among involuntary patients with psychotic disorders

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Association of treatment satisfaction and psychopathological sub-syndromes among involuntary patients with psychotic disorders

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Abstract
Purpose Previous research has shown a link between treatment satisfaction and global psychopathology in different groups of psychiatric patients. However, neither the relationship between treatment satisfaction and the sub-syndromes of global psychopathology nor their temporal ordering have been explored.
Methods Participants admitted involuntarily to psychiatric wards in the UK and diagnosed with psychotic disorders ($N = 232$) were included. Treatment satisfaction and psychopathological sub-syndromes (i.e., manic excitement, anxiety-depression, negative symptoms, positive symptoms) were measured within 1 week and at 1 month after admission.
Results Repeated measures ANOVAs showed that higher treatment satisfaction is associated with lower scores on the manic excitement, anxiety-depression and positive symptom sub-syndromes, while no significant association was found for negative symptoms. However, cross-lagged panel analyses showed that treatment satisfaction predicted change only in positive symptoms while none of the paths from the relevant sub-syndromes to treatment satisfaction was significant.
Conclusion Treatment satisfaction can be regarded as an antecedent of changes in positive symptoms only. These results underline the importance of examining psychopathological sub-syndromes separately as they may relate differentially to other important correlates of psychoses.

Keywords Treatment satisfaction · BPRS sub-syndromes · Psychoses

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Introduction

Treatment satisfaction refers to patients' perceptions concerning their satisfaction and appropriateness of their treatment [25]. Satisfaction with treatment is critical to treatment adherence [9] and among the most widely explored patient-reported outcomes [18]. A link between treatment satisfaction, assessed within a maximum of 3 days after admission and global psychopathology is clearly established with higher satisfaction associated with more favourable outcomes [6, 24, 25]. Involuntary legal status has consistently been identified as a predictor of lower satisfaction [10] when compared to patients with voluntary admission status and among involuntary patients perceived coercion has been identified as an antecedent of treatment satisfaction [14]. Thus, the targeting of involuntary patients' satisfaction is of clinical relevance, but also an important ethical issue, as these patients cannot discontinue their treatment even when they are displeased with it [14].

Does treatment satisfaction influence symptom change or does symptom change influence treatment satisfaction or both? Theoretically, it is usually assumed that higher treatment satisfaction is linked to more symptom improvement while lower satisfaction is linked to no improvement or even a deterioration of symptoms. For example, research has shown higher treatment satisfaction

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to predict lower global psychopathology among patients with a range of psychiatric diagnoses [6, 24, 25]. Nonetheless, satisfaction has also been modelled as an outcome. For example, Katsakou et al. [14] showed that patients who perceived less coercion at admission and during hospital treatment and patients with more symptom improvement expressed higher treatment satisfaction, see Bjorngaard et al. [4] and Shiva et al. [33]. As described by Burkholder and Harlow [7] structural equation models that examine cross-lagged time paths between variables can help to determine their temporal ordering. If cross-lagged paths from both treatment satisfaction to symptoms and from symptoms to treatment satisfaction were statistically significant, a reciprocal association between the constructs would be suggested. However, if only the path from treatment satisfaction to symptoms is statistically significant, it may be concluded that treatment satisfaction precedes symptoms and not the other way round. Conversely, if only the path from symptoms to treatment satisfaction is significant, symptoms may be seen as an antecedent of treatment satisfaction.

These studies exploring treatment satisfaction have used global psychopathology as the criterion. However, among patients with psychotic disorders, global measures of psychopathology comprise at least four interpretable sub-syndromes, namely manic excitement, anxiety-depression, negative symptoms and positive symptoms, which may be influenced by separate processes and aetiologies [30]. Citing Lachar et al. [15] and Van der Does et al. [34], Shafer [32] advocates examination of these sub-syndromes independently, arguing that using global scores may mask important treatment effects and specific areas of symptom change. Nonetheless, due to the dearth of research on sub-syndromes, specific mechanisms and therefore hypotheses for each sub-syndrome cannot be specified. However, in general, admission onto a psychiatric ward is expected to promote clinical improvement including symptom outcomes [3].

Aims and hypotheses

The relationship between subjective treatment satisfaction and the facets of global psychopathology have not been explored. Moreover, the direction of the association between treatment satisfaction and psychopathological symptoms has not been tested. A longitudinal design, where both treatment satisfaction and psychopathological sub-syndromes are measured repeatedly across time can facilitate exploration of these questions.

Following on from this, three hypotheses were tested:

i) Patients with higher treatment satisfaction during the first week of admission will report lower scores on the manic excitement, anxiety-depression, negative and positive sub-syndromes overall (i.e., between the first week of admission and 1 month post admission) than those with lower treatment satisfaction.
ii) In a cross-lagged panel design with latent variables, higher treatment satisfaction will predict symptom improvement between the first week of admission and 1 month post-admission.
iii) In a cross-lagged panel design with latent variables, fewer symptoms will predict higher satisfaction with treatment between the first week of admission and 1 month post-admission.

Method

Participants

All potential participants had been admitted involuntarily to a psychiatric ward in the UK between July 2003 and July 2005 and were recruited for a larger study for which detailed inclusion criteria and recruitment process have been described elsewhere [26]. Data collection for the initial study was approved by the multicentre research ethics committee and all participants gave written informed consent to take part. Compared to all eligible patients, participants interviewed at baseline were more likely to be younger and more likely to be male [cf., 26]. Of the 778 patients interviewed at baseline, only those diagnosed with schizophrenia or other psychosis, according to the ICD-10 categories (i.e., F20-29) were included ($N = 383$). A mean age of 35.91 ($\pm$10.94) was reported and 276 (72%) of the participants were male.

Measures

In baseline interviews, participants were asked to provide socio-demographic information including ethnicity (the United Kingdom census 2001 categories collapsed into 2 categories: white versus ethnic minority), and education (4 categories: no qualification, GCSE grades A–C, 'A' level or equivalent, and degree). Information on the total length of stay (in days) was also collected from medical records. Measures of treatment satisfaction and psychopathological sub-syndromes were each measured within 1 week and at 1 month post-admission. For each construct, multi-item scale scores were computed by averaging participants' responses across the relevant items.

The Client's Assessment of Treatment Scale (CAT) was used to assess treatment satisfaction [12, 25] which has been used in studies with psychiatric inpatients. The scale assesses patients' subjective satisfaction and perceptions of

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appropriateness of their treatment using 7 items (e.g., "Do you believe you are receiving the right treatment/care for you here?", "Are relations with other staff members pleasant for you?", "Does your psychiatrist understand you and is he/she engaged in your treatment/care?"). Each item is rated on a 11-point Lickert-type scale that ranges from 0 'not at all' to 10 'yes entirely' ($M = 5.51 \pm 2.77$ and 6.05 ± 2.61 at week 1 and 1 month, respectively).

Psychopathological symptoms were researcher rated using the 24-item Brief Psychiatric Rating Scale (BPRS) [35]. Items assess symptom severity on 7-point Likert-type scales with end points that range from 'not present' to 'extremely severe'. Sub-syndromes were indexed using a factor analytic solution of the BPRS among patients with schizophrenia living in the UK [24]. Manic excitement ($M = 2.10 \pm 0.61$ and 1.56 ± 0.56 at week 1 and 1 month, respectively) was assessed by 9 items (e.g., hostility, elevated mood), anxiety/depression ($M = 2.28 \pm 0.92$ and 2.03 ± 0.88 at week 1 and 1 month, respectively) by 6 items (e.g., somatic concern, anxiety), negative symptoms ($M = 1.79 \pm 0.88$ and 1.63 ± 0.72 at week 1 and 1 month, respectively) by 4 items (e.g., disorientation, blunted affect) and positive symptoms ($M = 3.18 \pm 1.22$ and 2.20 ± 1.22 at week 1 and 1 month, respectively) using 5 items (e.g., grandiosity, suspiciousness).

Analytic strategy

Prior to testing the study hypotheses, listwise deletion procedures were used to account for missing data. Thus, in order to assess the representative of our samples *t* test and χ^2 analyses were conducted to compare those eligible for the study ($N = 383$) and participants for whom complete data were available at both points of time ($N = 232$).

Following Luszczynska et al. [16] the hypotheses were tested in 3 analytic steps. First, correlations between the variables were examined. Second, repeated measures analyses of variance across two time points with treatment satisfaction as a between subjects factor (two levels) was used to examine the association between initial treatment satisfaction and each sub-syndrome over time (hypothesis 1). Third, a two-step structural equation model (SEM) [1] was used to assess the temporal ordering of treatment satisfaction and each sub-syndrome (hypotheses 2 and 3).

The EQS 6 programme [3] was used to test the temporal ordering of treatment satisfaction and each sub-syndrome using the maximum likelihood method for all analyses. A two wave cross-lagged panel model with a 3-week time lag was estimated. A two-step approach to SEM was used to assess the validity and reliability of the constructs before their use in the structural model [1].

In the measurement models, treatment satisfaction and the focal sub-syndrome at both time points were modelled simultaneously in a single model. Ideally, parameter loadings for each separate item on the corresponding latent factors would be estimated. However, the size of the sample was too small for the number of estimated parameters that such a model would produce, so an item parcelling strategy [2] was adopted. Specifically, we created three indicators for measures of treatment satisfaction and each psychopathological sub-syndrome (at each time point) using randomly selected item parcels. The same items were included in the parcels at each time point (to ensure that the nature of the constructs did not change over time). Reference indicators for each latent variable were created by fixing the highest indicator's loading to 1 and as is the usual case in confirmatory factor analysis, the latent constructs were allowed to co-vary. Error terms across time points for the same indicator were allowed to co-vary, where the Lagrange multiplier test indicated that this would lead to a statistically significant improvement in model fit [21].

Subsequent path models examined crossover paths between satisfaction and the focal sub-syndrome. Specifically, the association between treatment satisfaction during week 1 of admission (time 1) and the focal sub-syndrome at 1 month post-admission (time 2) was compared to the relevant association between the focal sub-syndrome during week 1 of admission (time 1) and treatment satisfaction measured at 1 month post-admission (time 2). Autoregression coefficients were also specified to control for covariance stability between the same constructs over time.

As the chi-square goodness of fit statistic is sensitive to sample size [17] additional recommended indices for goodness of fit and cutoffs [11] were used to evaluate the adequacy of the models. Specifically, in addition to the χ^2 test statistic, the comparative fit index (CFI), non-normed fit index (NNFI) and the root-mean square error of approximation (RMSEA) are reported. A non-significant χ^2 value ($p > 0.05$), CFI and NNFI values of 0.90 (or above) and a RMSEA of 0.08 (or lower) reflect adequate model fit.

Results

Comparison between participants eligible for the study ($N = 383$) and participants for whom complete data were available at both time points ($N = 232$) showed that these groups differed neither in gender, age, ethnicity, education and length of stay. Table 1 shows the corresponding descriptive statistics and frequencies.

Table 2 presents the correlations between the study variables. Higher treatment satisfaction measured during week 1 was associated with lower global psychopathology, manic excitement, anxiety-depression and positive symptoms at both time points (*r* range from −0.12 to −0.19).

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Table 1 Descriptive statistics comparing patients at baseline and those with complete data at 1 month

	Baseline $N = 383$	1 month $N = 232$
Male		
N (%)	72	72
Age on admission		
Mean (SD)	35.91 (10.95)	35.84 (11.47)
Ethnicity		
White (%)	63	63
Education		
No qualifications (%)	31	30
A–C GCSEs (%)	24	25
'A' level or equivalent (%)	36	36
Degree (%)	9	10
Length of stay		
Mean (SD)	88.91 (84.09)	94.72 (85.42)

Contrary to expectation, lower treatment satisfaction during week 1 was associated with fewer negative symptoms although this did not reach a conventional level of statistical significance. Neither global psychopathology nor the four sub-syndromes measured within week 1 were associated with treatment satisfaction at 1 month (r range from −0.06 to 0.05). These results support our first hypothesis for manic excitement, anxiety-depression and positive sub-syndromes and indicate that treatment satisfaction precedes symptoms (hypotheses 2) rather than the reverse temporal hypothesis (hypothesis 3).

Changes in symptoms over time depending on treatment satisfaction

Repeated measures analyses of variance across two time points were conducted for each of the four sub-syndromes with treatment satisfaction (measured during week 1) as a between-subjects factor (two levels). For this analyses, treatment satisfaction scores were standardised and participants scoring above ($N = 113$) and below zero ($N = 119$), respectively, were categorised into high- and low-satisfaction groups.

The mean score for each sub-syndrome at high and low levels of satisfaction are shown in Fig. 1. Each sub-syndrome changed statistically significantly over time, reducing from week 1 to 1 month post-admission, $F(1, 230) = 149.80$ ($r = 0.63$), 22.69 ($r = 0.30$), 10.67 ($r = 0.21$) and 129.21 ($r = 0.60$) (all $p < 0.01$), respectively, for manic excitement, anxiety-depression, negative symptoms and positive symptoms. With exception of negative symptoms, $F(1, 230) = 2.52$, $p > 0.05$ ($r = 0.10$), patients with higher treatment satisfaction reported fewer symptoms overall (i.e., across both time points), $F(1, 230) = 4.74$, ($r = 0.14$), 3.99 ($r = 0.13$) and 5.59

Table 2 Correlations among the study variables during week 1 (T1) and 1 month (T2) post involuntary admission for patients with psychoses

	T-sat T1	T-sat T2	BPRS T1	BPRS T2	Manic T1	Manic T2	Anx-dep T1	Anx-dep T2	Negative T1	Negative T2	Positive T1	Positive T2
T-sat T1		0.52**	−0.19**	−0.15*	−0.18**	−0.12***	−0.15*	−0.14*	0.09	0.11†	−0.15*	−0.17*
T-sat T2			−0.02	−0.29**	0.02	−0.23**	−0.06	−0.20**	0.05	−0.04	−0.05	0.25**
BPRS T1				0.51**	0.69**	0.29**	0.55**	0.38**	0.40**	0.25**	0.73**	0.42**
BPRS T2					0.22**	0.71**	0.41**	0.68**	0.31**	0.42**	0.31**	0.83**
Manic T1						0.36**	0.08	−0.02	0.11	0.02	0.40**	0.19**
Manic T2							0.14*	0.22**	0.12	0.12	0.09	0.49**
Anx-dep T1								0.62**	0.07	0.10	0.12	0.20**
Anx-dep T2									0.11	0.17*	0.18*	0.36**
Negative T1										0.58**	0.10	0.20**
Negative T2											0.08	0.22**
Positive T1												0.42**
Positive T2												

T1 time 1, *T2* time 2, *T-Sat* treatment satisfaction, *BPRS* brief psychiatric rating scale (mean score), *Manic* manic excitement, *Anx-dep* anxiety/depression

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.07$, † $p < 0.09$, $N = 232$

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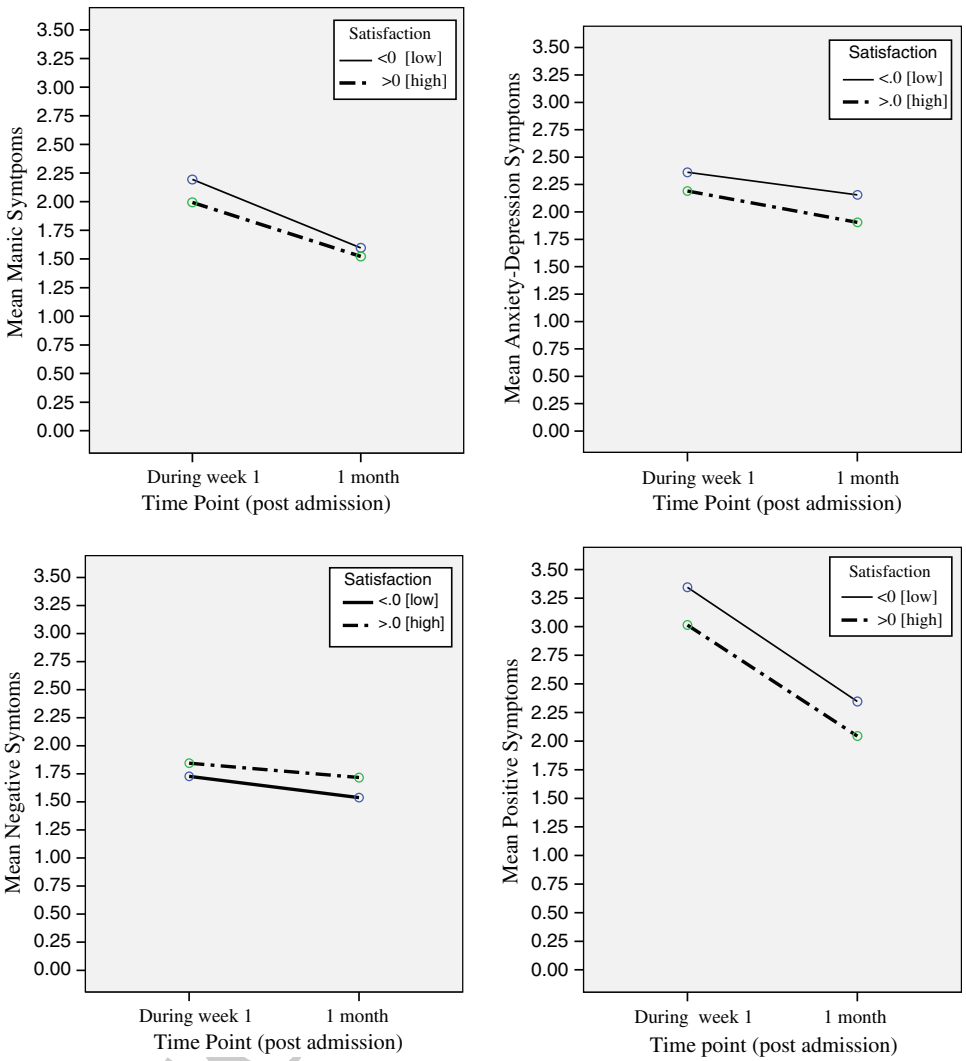

Fig. 1 Mean scores on the sub-syndromes during week 1 and at 1 month post-admission with initial treatment satisfaction as the between-subjects factor

($r = 0.16$) for manic excitement, anxiety-depression and positive symptoms, respectively. For each sub-syndrome the interaction between time and satisfaction was insignificant indicating that the reduction in symptoms was similar for participants high or low in satisfaction, $F(1, 230) = 2.05$, 0.62, 0.40 and 0.30 (all $p > 0.05$) for manic excitement, anxiety-depression, negative symptoms and positive symptoms, respectively. Thus, hypothesis 1 was supported for manic excitement, anxiety-depression and positive symptoms only. As the negative sub-syndrome was unrelated to treatment satisfaction it was excluded from all further analyses (Fig. 2).

Table 3 shows that the measurement model for each sub-syndrome fitted the data reasonably well. The factor loading of each indicator to its hypothesised latent factor was significant providing evidence of a stable structure in each group.

Table 4 presents the goodness of fit indices for the cross-lagged panel models. Results show that for manic excitement, neither of the cross-lagged effects was statistically

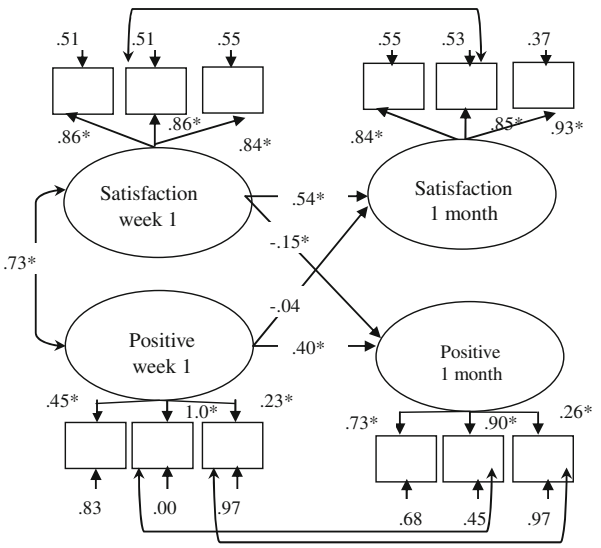

Fig. 2 Standardised parameter estimates for the full SEM model of treatment satisfaction and positive symptoms among patients with psychotic disorders

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Table 3 χ^2 and fit indices for the measurement models

Model	χ^2	*df*, *N*	RMSEA	90% CI for RMSEA	NNFI	CFI
Manic excitement	63.213, $p = 0.05$	46, 232	0.04	0.00–0.06	0.98	0.98
Anxiety-depression	73.147, $p = 0.00$	44, 232	0.05	0.03–0.08	0.97	0.98
Positive symptoms	53.52, $p = 0.18$	45, 232	0.03	0.00–0.06	0.99	0.99

RMSEA root-mean-square error of approximation, *CI* confidence interval; *NNFI* non-normed fit index, *CFI* comparative fit index

Table 4 χ^2 and fit indices for the cross-lagged panel models

Model	χ^2	*df*, *N*	RMSEA	90% CI for RMSEA	NNFI	CFI
Manic excitement	80.044, $p = 0.00$	47, 232	0.06	0.03–0.08	0.96	0.97
Anxiety-depression	89.006, $p = 0.00$	46, 232	0.04	0.04–0.08	0.95	0.97
Positive symptoms	62.125, $p = 0.06$	46, 232	0.04	0.00–0.06	0.98	0.99

RMSEA root-mean-square error of approximation, *CI* confidence interval, *NNFI* non-normed fit index, *CFI* comparative fit index

significant ($\beta = 0.11$ and 0.02 for the path from satisfaction during week 1 to manic excitement at 1 month and from manic excitement during week 1 to treatment satisfaction at 1 month, respectively). A similar pattern of results was observed for the anxiety-depression sub-syndrome. Specifically, neither the path from treatment satisfaction during week 1 to anxiety-depression at 1 month ($\beta = -0.04$) or anxiety-depression during week 1 to treatment satisfaction at 1 month ($\beta = -0.04$) were statistically significant. In contrast, results for the positive sub-syndrome revealed a statistically significant negative beta coefficient for the path from treatment satisfaction during week 1 to positive symptoms at 1 month ($\beta = -0.15$) while the path for the reverse temporal ordering was negligible and insignificant both in size and in statistically ($\beta = -0.04$). Supporting this, the model fit indices reported in Table 4 show that the cross-lagged model for the positive sub-syndrome fit the data well, χ^2 (46, 232) = 62.13, $p = 0.06$, CFI = 0.99, NNFI = 0.98, RMSEA = 0.04 (90% CI 0.00–0.06). Thus, hypothesis 2 was supported for the positive sub-syndrome only while no support for hypothesis 3 was found.

Discussion

The relationship between treatment satisfaction and psychopathological sub-syndromes were examined among involuntary in-patients in the UK with psychotic disorders. With exception of the negative sub-syndrome, participants reporting higher treatment satisfaction exhibited fewer symptoms compared to those with lower treatment satisfaction. Thus, the first hypothesis was supported for all sub-syndromes except negative symptoms. The cross-lagged panel analysis showed that treatment satisfaction predicted change in only the positive symptom sub-syndrome providing support for our 2nd hypothesis. The reverse temporal hypothesis (hypothesis 3) was not supported for any of the sub-syndromes.

The finding that treatment satisfaction relates differentially to the sub-syndromes of psychoses is new and adds to an increasing body of research emphasising the importance of examining sub-syndromes separately [33]. Indeed, disregarding different symptom dimensions may mask isolated areas of symptom change and dilute the global effect. A second new finding is that change in treatment satisfaction predicts change in scores on the positive sub-syndrome, confirming the assumption that satisfaction can be regarded as an antecedent of positive symptoms. However, neither of the cross-lagged paths was significant for manic excitement and anxiety-depression sub-syndromes, suggesting spurious time-lagged correlations arising from significant concurrent associations and the stability of these constructs over time.

The reasons why treatment satisfaction should influence change in positive symptoms versus the other sub-syndromes is unclear. However, the finding is consistent with previous research showing that positive symptoms may be more malleable and amenable to intervention [19]. In the current study sample, only 19% ($N = 44$) left hospital prior to the assessment at 1 month and of these, the mean length of stay was 19.18 days (SD = 7.04). Consequently, as medication adherence was involuntary and regulated among the majority of patients' adherence is an unlikely mediator.

While one can only speculate about the mechanisms of change we believe that individual difference and social factors may also play an important role in the relationship between treatment satisfaction and symptom improvement. For example, patients' perceptions of autonomy may mediate the relationship between treatment satisfaction and improvement in positive symptoms. Indeed, according to some theories, (e.g., self determination theory) [31]

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autonomy supportive environments (e.g., high levels of perceived control among patients) have been shown to facilitate motivation for treatment [5]. This speculation certainly coincides with the finding that higher perceived coercion among involuntary patients is linked to lower levels of satisfaction with treatment [14]. Supporting this, in a recent qualitative study objectification and marginalisation of the patient was identified by patients as one of key themes concerning their care [28].

It is noteworthy that the CAT scale includes components of therapeutic alliance in addition to more general aspects of treatment satisfaction and it might thus be argued that these constructs are synonymous. Indeed therapeutic alliance has been shown to explain similar proportions of symptom improvement to that found in the current study [8]. Nonetheless, recent research has shown that although therapeutic alliance and treatment satisfaction share common variance, they too provide distinct information from this overlap [29]. However, incremental predictive validity studies including both of these constructs in addition to other predictors of symptom reduction, such as unmet needs for care [22] and subjective quality of life [20] among psychiatric patients are not widely reported thus more research is needed to ascertain their relative importance.

The research reported here adds to the growing body of evidence indicating that subjective patient reports are predictive of important clinical outcomes. As treatment satisfaction is relatively easy to elicit and could be added easily to routine clinical practice these findings may have considerable practical application. Nonetheless, the effect size estimate between treatment satisfaction and improvement in positive symptoms was relatively small ($\beta = -0.15$). In any case the findings indicate that it may be worth developing interventions to enhance treatment satisfaction. If such interventions could be developed and were found to be effective, they might also shed further theoretical light on the psychological antecedents of positive symptoms, e.g., by identifying moderators and mediators of treatment re-training effectiveness. This could also facilitate assessment of the potential risks, gains and cost effectiveness of such interventions and therefore assessment of their practical utility.

The use of latent variable SEM allowed examination of relationships between constructs with measures that were relatively free of measurement error. Additionally, the sample size was large and comprised a relatively large and diagnostically homogeneous sample. Moreover, the use of researcher-rated rather than self-reported outcomes reduced the likelihood of artificially inflating effect size estimates resulting from common method variance. Nonetheless, data were only available for those patients willing to take part in academic research which may have introduced a selection bias. Also, although the sample size is impressive for this particular group of patients the large number required for statistical modelling meant that examination of each item individually to its respective factor was not feasible in the SEM. This is important, as while the CAT items have good face validity and predictive utility, in addition to high internal consistency reliability [26], the factorial validity of the CAT is yet to be established.

To test the generalisability of the study findings, future research is needed to replicate the current findings in samples with different diagnoses and for patients in different treatment settings. Moreover, theory-based research could help to locate the specific mechanisms that lead to change in positive symptoms. For these purposes, future studies could test psychological theories (such as self-determination theory) which provide a theoretical framework for exploring these relationships.

Understandably, clinicians might think that immediate patient satisfaction is not that relevant among patients compulsory admitted. However, this study emphasises that what patients think about their care within the first week of treatment is an indicator of changes in positive symptoms at 1 month post-admission and thus, could be considered even when symptom levels are often still high and the situation tense.

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Conflict of interest statement All authors declare that they have no conflicts of interest.

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