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Comparison of three scales (BIS, SUMD and BCIS) for measuring insight dimensions and their evolution after one-year of follow-up: findings from the FACE-SZ Cohort

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ABSTRACT

The aim of our study was to compare the performance of three different instruments measuring clinical and cognitive dimensions of insight.

Data on 182 outpatients with schizophrenia and one-year follow-up assessments was drawn from the FACE-SZ cohort. Awareness of clinical state (« **clinical insight** ») was measured using both a clinician-rated measure (the Scale to assess Unawareness of Mental Disorder (SUMD)), and a self-report measure (the Birchwood Insight Scale (BIS)). Cognitive insight was measured using a self-report measure (the Beck Cognitive Insight Scale (BCIS)). For each scale, change in insight was examined at the follow-up.

Correlations between SUMD and BIS subscales measuring same dimensions were significant. BIS-BCIS correlations were weak for all combinations except between BIS illness dimension and BCIS composite score. At the follow-up, BIS and SUMD awareness of treatment need improved whereas illness and symptom awareness increased only on the SUMD. Conversely, cognitive insight composite scores decreased.

Despite relatively good overall agreement between the two clinical insight instruments, considerable variability for similar insight dimensions measured by different instruments was found. Agreement between cognitive and clinical insight is moderate. Our study strengthens the argument that insight is harder to operationalize than other symptoms and may explain why it is so seldom explicitly targeted in schizophrenia treatment.

Keywords: Schizophrenia; Insight; Clinical Insight; Cognitive Insight,

1. Introduction

Lack of insight is a common clinical characteristic of non-affective psychosis and par-

ticularly schizophrenia. Studies show that 50% to 80% of schizophrenia patients have impairment in awareness of having a mental disorder (Amador and Gorman, 1998) with consequences on social functioning (Erickson et al., 2011), poor adherence to medication (Misdrahi et al., 2012), impairment in the capacity to consent to treatment (Capdevielle et al., 2009) and poor treatment outcome (David et al., 1995). Furthermore, small negative relationships between insight and global, positive and negative symptoms, and between insight and depressive symptoms in schizophrenia have been found (Mintz et al., 2003).

Over the past 20 years, our understanding of insight has dramatically changed. **At first, insight, also referred to as « clinical insight » was conceptualized as a patient's capacity to perceive his/her symptoms and see himself/herself as having a mental illness. If early accounts considered clinical insight as a one-dimensional binary phenomenon,** it is now defined as an evolving multidimensional state, uninterrupted and heterogeneous in its intensity. This multidimensional state is challenging for creating measurement tools. There is now consensus about the components and the necessity to view **clinical** insight as a continuum with intermediate states (David, 1990)(Amador et al., 1991)(Marková and Berrios, 1992). The most commonly and systematically used multidimensional definition of **clinical** insight was developed by Amador and Strauss, with the clinician-administered Scale to assess Unawareness of Mental Disorder (SUMD) (Amador and Strauss, 1990). The authors distinguished 2 main dimensions: awareness of illness and the ability to attribute symptoms to the disease. However, according to David, **clinical** insight consists in the ability to recognize mental illness, compliance with treatment and the capacity to relabel unusual mental events as pathological (David, 1990). These 3 dimensions, partially overlapping with those of Amador, were used to develop the 8-item self-report Birchwood Insight Scale (BIS) (Birchwood et al., 1994). Only two small cross-sectional studies have compared insight assessment in patients with chronic schizophrenia using the SUMD and BIS (Sanz et al., 1998; Young et al., 2003). A lower level of **clinical** insight was found with the BIS, regardless of administration order (Young et al., 2003). Furthermore, a significant positive correlation was found between both scales, but correlations differed considerably according to the order of test administration (Sanz et al., 1998; Young et al., 2003). To our knowledge, no study has compared the change in interview and self-report assessed insight over time.

In 2004, Beck et al. **proposed an important extension to the insight concept by introducing the concept of cognitive insight. This is defined as the ability to examine and question beliefs and interpret experiences, building on the principles of cognitive theory and Cognitive Behavioral Therapy (CBT) (Beck et al., 2004).** The self-report Beck Cognitive Insight Scale (BCIS) has

two distinct dimensions: self-reflectiveness (SR) and self-certainty (SC). The first assesses introspection and willingness to observe one's own mental productions and consider alternative explanations, while the second measures mental flexibility and overconfidence in one's beliefs (Beck et al., 2004).

Because of the dramatic impact of lack of insight on treatment adherence and functioning, several therapies have been developed to improve insight, with inconclusive results not replicated to date (Amador and Johanson, 2000; Corrigan et al., 2001; Tai and Turkington, 2009). Several factors could explain this. Firstly, assessment using schedules based on different theoretical approaches or evaluation methods makes comparisons difficult. Secondly, the natural course of insight and its dimensions were at the time poorly understood.

The aim of our study was to compare the performance of three different instruments to measure the dimensions of insight in a sample of outpatients. We used the SUMD as the gold standard to evaluate clinical insight. Whereas the SUMD can be viewed as providing an objective measure of insight, self-reported subjective assessment tools such as the BIS could be equally relevant given the complexity of the concept. We thus examined agreement between subscales measuring similar dimensions of insight using **clinician-rated** and self-report assessment tools. Instrument-specific subscales measuring different dimensions are not necessarily expected to be highly correlated. However agreement is expected across instruments for subscales measuring similar dimension, especially for the treatment dimensions of the SUMD and BIS. Change in insight dimensions over time is also expected to be consistent from one instrument to another. To evaluate cognitive insight we used the BCIS, translated and validated in French (Favrod et al., 2008).

In order to appreciate the bias of administration order between self-report and **clinician-rated** scales, overall agreement between the three instruments was studied after stratifying patients according to administration order.

2. Methods

2.1. Participants

This study was based on data extracted from the FondaMental Advanced Centers of Expertise in Schizophrenia (FACE-SZ) cohort, set up within the ongoing French national network of

schizophrenia expert centers in 10 French cities. All patients evaluated in an expert center and diagnosed with DSM-IV-TR criteria schizophrenia, schizoaffective or schizophreniform disorder were enrolled in the cohort. At inclusion, patients underwent standardized psychiatric, somatic and neuropsychological assessments. Data were collected using dedicated electronic medical records software (for presentation see Schürhoff et al., 2015).

The assessment protocol was approved by the relevant Ethical Review Board (CPP-Ile de France IX) on January 18th, 2010.

Of the initial national sample, 513 patients aged below 65 years were extracted. One-year follow-up data was available for 182 patients (35.5%).

2.2. Measurements

At baseline, socio-demographic and lifestyle data were collected.

The following evaluations were performed at inclusion and at the one-year follow-up:

- Psychopathology was assessed using Positive and Negative Syndrome Scale (PANSS). Four summary scores were used: positive symptom, negative symptom, general psychopathology and total score (Kay et al., 1987).
- Current depressive symptoms were evaluated using the Calgary Depression Scale. Patients with a score of 6 and above were considered as clinically depressed (Addington et al., 1993).
- Insight was evaluated using the abbreviated version of the **clinician-rated** SUMD (Michel et al., 2013). The SUMD is widely used in clinical trials and epidemiological studies with satisfactory inter-rater reliability (Raffard et al., 2010), but more rarely in clinical practice because of its length (74 items). Its abbreviated version is better adapted to clinical practice (Michel et al., 2013).

The abbreviated SUMD comprises 9 items assessing current awareness of the following states: having a mental disorder, its consequences, effects of treatment, and of the following symptoms: hallucinatory experiences, delusional ideas, disorganized thoughts, blunted affect, anhedonia and lack of sociability. Each item was coded as follows: not applicable (coded 0), aware (1), slightly aware/unaware (2), and seriously unaware (3). The few patients with ratings of 0 (Not applicable) were reclassified as 1 (Aware), as from a clinical perspective 'not applicable' is usually chosen when a low level of illness or symptoms or an absence of medication makes the investigation of insight questionable. Awareness of symptoms was explored only if the patient was sufficiently symptomatic (ie score ≥ 3 on the PANSS for the same item). For the purpose of this study we added for the last 6 items (symptom awareness), the

evaluation of symptom attribution with the following categories: not applicable (0), correct (1), partial (2) and incorrect (3) attribution. Those with scores of 0 were reclassified as 3 (Incorrect Attribution) as this corresponded to an inability to explore attribution due to lack of awareness.

The following variables were used in the analysis: (i) awareness of having a mental disorder, (ii) of its consequences, (iii) of the effects of treatment, (iv) of the main symptoms (score on awareness of symptoms 4-9), and symptom attribution (score on attributions of symptoms 4-9). A total awareness score was also calculated.

- The self-report Birchwood Insight Scale (BIS) (Birchwood et al., 1994) comprises 8 items grouped into 3 subscales: 1) awareness of having a mental illness, 2) the appreciation of the necessity of treatment and 3) the proper attribution of symptoms.

Scores on the three subscales and an overall score were used in the analysis.

- Cognitive insight was assessed with the 15-item self-report Beck Cognitive Insight Scale (BCIS)(Beck et al., 2004). Participants rated the extent to which they agreed with statements on a scale from 0 (do not agree at all) to 3 (agree completely). The items were grouped into 2 subscales, self-reflectiveness (9 items) and self-certainty (6 items). A composite cognitive insight index score (Composite Index) was obtained by subtracting the self-certainty subscale score from the self-reflectiveness subscale score.

Note that the two self-report measures of insight were not monitored during the clinical assessment, but completed separately the same day at a later stage.

2.3. Data collection procedure

In each expert center, data were collected by trained neuro-psychologists and psychiatrists. All raters participate in yearly training sessions and their ratings of a sample of videoed study patients are compared. Inter-rater variability is generally low. Monthly meetings are also organized in order to maximize the standardization of the data collection process within and across centers.

The order of administration of the three insight scales at inclusion and the one-year follow-up was different according to the center. Six centers (corresponding to 60.7% of the sample) began by administering the self-report questionnaires followed a few hours later or the following day (< 24hours) by the clinical interview. The other four centers did the opposite.

2.4. Statistical analysis

Baseline socio-demographic, clinical and insight characteristics were compared between patients with and without follow-up data, and according to order of administration of self-report versus **clinician-rated** insight scales, using the Chi² test for categorical variables and the t-test or Wilcoxon rank sum test for continuous variables depending on the normality of the distributions tested using Shapiro-Wilks test.

The study sample was described at inclusion and at the one-year follow-up, and compared using McNemar's test for categorical variables and the paired t-test for continuous variables. Correlations between the different insight scales and subscales, both at inclusion and at the one-year follow-up, were examined by calculating Spearman correlation coefficients, given that most score distributions were asymmetrical. Associated p-values were given.

For Figure 1 and Table 2 only, SUMD and BCIS self-certainty scores were reversed so that whatever the scale, a higher score corresponded to better insight.

The distribution of scores on the different insight subscales between inclusion and the one-year follow-up were compared using the paired t-test, after verifying the normality of the distributions of score differences.

3. Results

3.1. descriptive data

Of the study sample (N=182), 78.6% were male and the median age was 33.1 years (range 16–62) (Table 1). The majority of patients were given a diagnosis of schizophrenia (80.8%). The percentage of psychotic episodes in the past year decreased between inclusion and the one-year follow-up (p=0.012); global functioning improved (p<0.0001). Total PANSS score and each sub-type improved (p-values ranging from <0.0001 for positive PANSS score to 0.029 for General Psychopathology).

The participation rate at the one year follow-up was only on 35.5%. It is important to note that each center has established strong links with local health services and provides support to clinicians in delivering personalized care plans but does not actually deliver care during the follow-up.

3.2. Correlations between total scores on the 3 insight scales:

Total sample:

Correlations between total scores on the 3 insight scales are shown in Figures 1 a, b and c. All total insight scores increased hand in hand, with moderate to high coefficients. The highest correlation coefficient was between BIS and SUMD ($r=0.56$), followed by BCIS and SUMD ($r=0.41$) and finally BIS and BCIS ($r=0.37$) (all three p -values <0.0001).

Stratified according to order of administration of the self- and clinician-rated instruments:

Correlations coefficients between total scores on the 3 insight scales for the group of patients with the SUMD administered first were: $r=0.61$ ($p<0.0001$) between BIS and SUMD, $r=0.28$ ($p=0.03$) between BCIS and SUMD and $r=0.44$ ($p=0.0003$) between BIS and BCIS.

The equivalent correlation coefficients for the group of patients with the self-report scales administered first were: $r=0.51$ ($p<0.0001$), $r=0.47$ ($p<0.0001$) and $r=0.38$ ($p=0.0005$), respectively.

3.3. Correlations between dimensions of the 3 insight scales:

Correlation coefficients between BIS and SUMD dimensions varied from 0.3 for BIS symptom dimension and SUMD treatment need, to 0.48 for BIS and SUMD treatment dimensions (all p -values <0.0001). Coefficients for BIS and SUMD awareness of symptoms dimensions and awareness of illness dimensions were 0.33 and 0.43 (both p -values <0.0001), respectively. Overall there was no pattern of equivalent SUMD and BIS dimensions correlating more highly than sub-scales measuring different insight dimensions.

Correlation coefficients between BIS and BCIS insight dimensions were moderate to weak ($r\leq 0.3$), for all combinations except between BIS illness dimension and BCIS composite score ($r=0.42$, $p<0.0001$).

Between BCIS and SUMD subscales, coefficients were all below 0.4, the highest being between Beck Composite score and SUMD awareness of symptoms ($r=0.38$, $p<0.0001$).

Correlations at the one-year follow-up followed the same pattern. The highest correlation was between BIS and SUMD awareness of treatment need ($r=0.50$, $p<0.0001$) (not shown).

3.4. Evolution of Insight at one year:

Awareness of treatment need improved on both BIS and SUMD scales, with the mean score increasing from 3.23 (0.98) to 3.41 (0.87) ($p=0.01$) for BIS and decreasing from 1.5 (0.68) to 1.35 (0.62) ($p=0.02$) for SUMD (Table 3). In addition, both illness and symptom awareness

increased on the SUMD scale ($p=0.007$ and 0.03 , respectively). Conversely, cognitive insight decreased with composite scores of 7.48 (6.05) and 6.38 (6.39) at inclusion and the follow-up, respectively ($p=0.04$).

4. Discussion

This study investigated to what extent two different clinical insight assessment scales and their dimensions were actually measuring the same concepts of insight in schizophrenia. We also compared these dimensions with an evaluation of cognitive insight. Finally, we investigated changes in scores at the different dimensions over the follow-up.

In the first part of our study, we found relatively strong correlations between the 3 total insight scores with scores increasing hand in hand, but this result hides the high variability between the subscales of the different measurement instruments.

For clinical insight, our results show that even though the BIS and SUMD scales are constructed according to similar underlying concepts, scores on the two scales are far from overlapping. For example, we found a weak correlation between items ‘awareness of symptoms’ on the BIS and SUMD at inclusion but also at the one-year follow-up (results not shown). Furthermore, our results show no change for the ‘symptom’ dimension of BIS at one year while this dimension improved with the SUMD. This discrepancy could be explained by the very different approaches to evaluating these dimensions. Although the scales are based on similar conceptual frameworks, the construction of the questionnaires, the formulation of the answers and the administration mode (self-report versus **clinician-rated**) are very different. When completing the SUMD, clinicians explore each symptom with a number of questions; consequently, for the item ‘awareness of symptoms’ which is based on the awareness of hallucinations, delusions, or anhedonia, patients do not actually have to recognize these experiences as symptoms. In contrast, the BIS ‘symptoms’ dimension named ‘relabeling symptoms’ is based on 2 assertions using the terms ‘symptoms’ and ‘unusual things’. The moderate correlation between this item and the SUMD attribution item underlines the complexity of this dimension, which may not completely capture all patient attribution given that patients may find it difficult to accept and understand the above terms. These dimensions require more items and a more precise description to be evaluated in a self-report scale. The lack of change at one year could reflect difficulties for therapists to act on attribution dimension but also the inability of the BIS to fully evaluate symptom dimension.

We found moderate to strong correlations between SUMD and BIS for treatment need which suggests we are measuring similar concepts. This association is also stable over time as we

found a similar correlation at one year. Furthermore, both SUMD and BIS scores improved for treatment need between inclusion and follow-up, as previously found (Young et al., 2003). This result could be explained by this dimension “treatment need” being one of the most discussed with patients, particularly in psycho-education sessions.

SUMD and BIS illness awareness dimensions correlated moderately, both at baseline and one year. However, this dimension improved over time when measured by the SUMD only. Interestingly, the BIS ‘awareness of illness’ dimension was also strongly correlated with the SUMD ‘symptom attribution’ dimension. Similarly, intra-scale correlations showed a strong association between SUMD items ‘awareness of illness’ and ‘attribution’. The BIS dimension ‘awareness of illness’ is based on 2 items: ‘I am mentally well’ and ‘If someone said I had a nervous or mental illness they would be right’. This last item implies that the patient imagines him/herself as others see him/her in order to be aware of having a mental disorder and so could be in keeping with research underlining the link between impaired ability to understand the minds of other people, i.e. Theory of Mind, and poor insight (Konstantakopoulos et al., 2014). The capacity to attribute symptoms to a mental disorder is still close to the conceptualization of insight as the ability to evaluate the correct attitude toward morbid change in oneself and to rely on the capacity to reflect upon self from the perspective of the other (David, 1999). Once more, the lack of improvement of this dimension on the BIS underlines the need to develop therapies other than psycho-education to act on attribution of insight dimension.

Regarding the association between cognitive and clinical insight, correlation coefficients of BCIS dimensions with BIS and SUMD dimensions are weak (<0.4), for all combinations except between BCIS composite score and BIS illness dimension. In their first paper, Beck et al. (2004) found moderate to strong correlations between the composite Index and the awareness of mental disorder SUMD dimension. This result was replicated in 51 first episode psychotic patients (Lepage et al., 2008). Another study of 138 schizophrenia patients found a strong negative correlation between BCIS composite score and SUMD total score (Bora et al., 2007). One study, based on middle-aged and older patients with psychotic disorders found significant correlations between BCIS composite score and BIS total score and relabeling of symptoms dimension (Pedrelli et al., 2004). These inconsistent results underline the multidimensional nature of insight and the huge variability of clinical and cognitive insight following the stage of disease and the study population. Clinical insight measures knowledge of information, symptoms and attribution while the BCIS measures the tendency for patients to question their knowledge and to be open to new information. Cognitive insight is a potential target for developing psychological treatments that will improve clinical insight. Indeed, several

studies have shown that CBT focusing on modification of beliefs leads to a decrease in conviction about delusional beliefs and distressing beliefs about hallucinations (Chadwick and Lowe, 1990, 1994). Cognitive insight could be a mediating factor between CBT and symptom improvement. But, in our study, we found a decline in BCIS composite score at follow-up, meaning a decrease in cognitive insight. This evolution, not congruent with clinical insight evolution, nor with positive clinical evolution at follow-up (symptoms and global functioning score), could reflect the natural course of cognitive dysfunction in schizophrenia. Indeed, patients with schizophrenia exhibit dysfunction preceding the onset of illness, which becomes more pronounced in the early years following diagnosis, then settles into a stable pattern (Lewandowski et al., 2011). Cognitive remediation could be a first step to improve cognitive insight and, indirectly, clinical insight via the mediating effect of cognitive insight. Our study strengthens the need to develop research exploring the links between symptom evolution and BCIS scores especially as previous studies have revealed a mixed impact of cognitive insight on outcome (Engh et al., 2010; Palmer et al., 2015; Premkumar et al., 2011).

We stratified the analysis according to order of self-report and **clinician-rated** questionnaires and found only weak differences in correlation coefficients between the 3 scales. Furthermore, the similarity of the main clinical variables in the ‘self-report first’ group and the ‘**clinician-rated** questionnaire first’ group strengthened our results. So the order of presentation between **self-report and clinician-rated** assessments will not have influenced our results. Our study did not confirm results of a small study comparing an interview and self-report assessment of insight in 33 patients with chronic schizophrenia (Young et al., 2003) and does not enable us to recommend an order of assessment for future studies.

LIMITATIONS

This study has several limitations. **Our results would need to be replicated in other samples of schizophrenia or schizoaffective disorder patients.** Furthermore, our sample is unlikely to be representative of all schizophrenia patients, particularly because institutionalized, hospitalized or very handicapped patients were not referred to the expert centers. Consequently impaired insight is likely to be underrepresented. **Future research should include the full spectrum of severity on insight for a better understanding of the relationship between self report and clinical assessment (Goldring et al., 2020).** But the multicentric network of expert centers allowing the collection of in-depth clinical data for a large sample of patients is a strength that counterbalances this recruitment bias.

Given the complexity of the notion of insight and of its measurement, BIS and SUMD total scores correlated well showing a relatively high level of agreement. However when assessing insight, the measurement method must be taken into account, as self-report insight measures a subjective appreciation of one's state whereas **clinician-rated** assessment reflects insight stemming from observed and objectivized patient behavior. Although we cannot postulate that one scale overestimates the level of insight compared to the other, it is important to note that scores on one scale may only moderately correlate with those for the equivalent dimension on another scale. Our study strengthens the argument that insight is a complex multi-dimensional concept which is difficult to measure and operationalize. This could partially explain why it is so seldom explicitly targeted in treatment interventions despite its clinical importance. **However, regarding clinical insight we recommend to use both scales for two main reasons. Firstly, this “multi-modal” assessment provides a more global picture of the insight phenomenon, taking into account both clinician and patients' perspectives. Indeed, if self-report measures are subject to numerous biases such as « social desirability », it is also the case for clinician-rated measures used to assess the dimensional aspects of symptoms of psychosis (Berendsen et al., 2020) . Secondly, clinician-rated measures of insight may not capture entirely patients' subjective experiences. Taking into consideration patients' perspectives on their symptoms could contribute to a more person-centered approach, a better therapeutic alliance and foster engagement in clinical care. We also recommend to measure cognitive insight in clinical routine, specifically when a cognitive and behavioral intervention is proposed as it has the potential to predict both change in delusional beliefs during treatment and treatment outcomes (Penzenstadler et al., 2020).**

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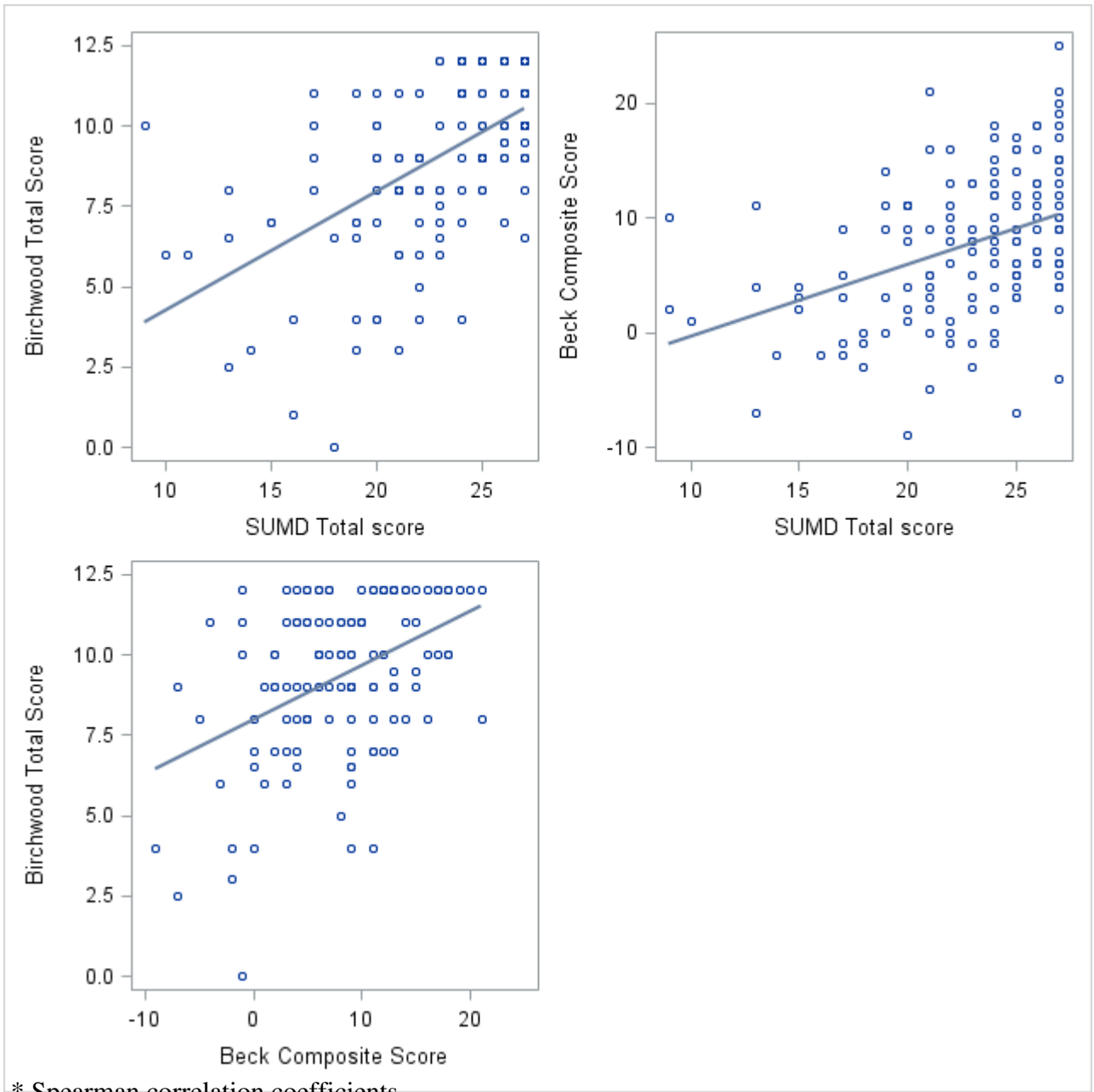
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Figures 1 a, b and c. Correlations* between total score on the 3 insight scales (high score = high insight)



* Spearman correlation coefficients

Table 1. Socio-demographic and clinical characteristics of patients at inclusion and the one-year follow-up

	N	At inclusion Median (min-max)	At 1 year Median (min-max)	p-value*
Age	182	33.1 (16.1-62.4)		
Sex (male) (%)	182	78.57		
Education (%):				
Low	53	29.12		
Medium	49	26.92		
High	80	43.96		
Marital Status (%):				
Single	146	82.95		
Married	19	10.80		
Other	11	6.25		
Occupation (%):				
Unemployed	127	72.16		
Employed	23	13.07		
Other	26	14.77		
Living alone (yes) (%)	174	34.48		
Substance abuse (yes) (%)	177	28.25	13.59	0.001 [#]
DSMIV diagnosis (%):				
Schizophrenia	147	80.77		
Schizoaffective disorder	32	17.58		
Schizophreniform disorder	3	1.65		
Age first psychotic episode	175	22 (11-47)		
Age first hospitalisation	151	23 (13-49)		
Depression (Calgary score _≥ 6) (%)	165	19.39	24.24	0.19 [#]
Global functioning score	165	50 (15-85)	55 (21-95)	<0.0001*
Psychotic episode in past year (%)	150	47.33	34.00	0.012 [#]
PANSS Scores:				
Positive	166	14 (7-29)	12 (7-27)	<0.0001*
Negative	166	21 (7-40)	19 (7-42)	0.001*
General Psychopathology	166	33 (18-71)	32 (17-57)	0.029*
Total score	166	68 (35-131)	64 (33-117)	0.0002*
Medication (%):				
Antipsychotic medication	182	85.16	86.81	0.36
Anxiolytic medication	182	26.92	25.27	0.40
Hypnotic medication	182	4.95	7.14	0.21
Antidepressant medication	182	30.22	31.87	0.40

*paired t-test

[#] McNemar test

Table 2. Correlations and associations between insight dimensions of Birchwood, Beck and SUMD insight scales

	BIS dimensions		SUMD dimensions				BCIS scores/dimensions			
	Illness	Treatment	Illness	Consequences	Treatment	Symptoms	Attribution	Self-refl.	Self-cert.	Comp. score
BIS dimensions										
BIS Symptoms	r=0.31 0.0001 147	r=0.47 <0.0001 145	r=0.40 <0.0001 145	r=0.35 <0.0001 145	r=0.30 <0.0001 145	r=0.33 <0.0001 145	r=0.41 <0.0001 143	r=0.26 0.003 128	r=0.099 0.26 130	r=0.22 0.01 128
BIS Illness		r=0.31 0.0002 145	r=0.43 <0.0001 148	r=0.36 <0.0001 148	r=0.35 <0.0001 148	r=0.38 <0.0001 148	r=0.43 <0.0001 146	r=0.34 <0.0001 131	r=0.29 0.0007 133	r=0.42 <0.0001 131
BIS Treatment			r=0.46 <0.0001 142	r=0.43 <0.0001 142	r=0.48 <0.0001 142	r=0.37 <0.0001 142	r=0.43 <0.0001 140	r=0.16 0.069 125	r=0.22 0.0142 127	r=0.22 0.0143 125
SUMD dimensions										
SUMD Illness				r=0.54 <0.0001 177	r=0.47 <0.0001 177	r=0.47 <0.0001 177	r=0.63 <0.0001 175	r=0.31 0.0002 141	r=0.10 0.21 143	r=0.29 0.0004 141
SUMD Conseq					r=0.39 <0.0001 177	r=0.55 <0.0001 177	r=0.51 <0.0001 175	r=0.23 0.005 141	r=0.18 0.034 143	r=0.27 0.001 141
SUMD treatment						r=0.38 <0.0001 177	r=0.51 <0.0001 175	r=0.21 0.01 141	r=0.056 0.51 143	r=0.18 0.026 141
SUMD sympt.							r=0.50 <0.0001 175	r=0.32 0.0001 141	r=0.21 0.012 143	r=0.38 <0.0001 141
SUMD attribut.								r=0.32 0.0001 140	r=0.14 0.11 142	r=0.32 0.0001 140
BCIS scores/dimensions										
Beck Self-refl.									r=0.17 0.036 144	r=0.85 <0.0001 144

Beck Self-cert.

r=0.63

<.0001

144

Notes: r = Spearman's correlation coefficients.

In bold: correlation coefficients between subscales on different instruments > 0.4, reflecting moderate to strong relationships

Table 3. Patient insight dimensions at inclusion and the one-year follow-up

	N	At inclusion Mean (std)	At 1 year Mean (std)	Change +=improved insight	p-value*
Birchwood Insight Scale:					
Symptom dimension	131	2.94 (1.17)	3.09 (1.11)		0.14
Illness dimension	131	2.69 (1.32)	2.85 (1.30)		0.11
Treatment dimension	130	3.23 (0.98)	3.41 (0.87)	+	0.013
<i>SUMD dimensions^a:</i>					
<i>Awareness of illness</i>	<i>160</i>	<i>1.58 (0.70)</i>	<i>1.44 (0.63)</i>	+	0.007
<i>Awareness of consequences</i>	<i>160</i>	<i>1.49 (0.70)</i>	<i>1.44 (0.67)</i>		0.32
<i>Awareness of need for treatment</i>	<i>159</i>	<i>1.50 (0.68)</i>	<i>1.35 (0.62)</i>	+	0.018
<i>Awareness of symptoms</i>	<i>159</i>	<i>1.59 (0.57)</i>	<i>1.48 (0.58)</i>	+	0.027
<i>Symptom attribution to illness</i>	<i>156</i>	<i>1.90 (0.70)</i>	<i>1.95 (0.71)</i>		0.39
Beck Cognitive Insight Scale:					
Self-reflectiveness	122	14.99 (4.71)	14.32 (4.62)		0.12
<i>Self-certainty</i>	<i>124</i>	<i>7.50 (3.35)</i>	<i>7.98 (3.68)</i>		0.12
Composite Score	121	7.48 (6.05)	6.38 (6.39)	-	0.039

In Italics: instruments or items for which a high score reflects low insight

^a patients with values of 0 were reclassified as 1 (aware) except for Symptom attribution to illness where they were reclassified as 3 (highly unaware)

*paired t-test