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## Group psychoeducation in bipolar disorder and its influence on the cognitive representation of illness and basic personality dimensions: a control group study

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### Summary

**Aims:** The study aims to determine whether participation in structured group psychoeducation has an influence on the cognitive representation of illness and whether the basic personality traits are mediating factors in the process of its potential change.

**Method:** Initially, the study included 40 consecutive patients with the DSM-IV diagnosis of bipolar disorder: the first 20 were included in the study group and the following 20 in the control group. To take part in the study, all patients had to be in functional remission. The final statistical analysis includes 14 patients from each group. Cognitive representation of illness was presented in terms of the following variables: acceptance of illness, locus of health control, general self-efficacy, hope for success, and beliefs about the condition. The intervention used was a structured group psychoeducation program. It comprised eight 90-minute meetings that combined workshops and lectures. Both groups were tested at three points in time (before intervention in the study group, after the intervention, and 6 months later).

**Results:** In the group who took part in the psychoeducation program, statistically significant positive changes were observed in the internal locus of health control, problem-solving, sense of self-efficacy and beliefs about bipolar disorder directly after the end of the program. Conscientiousness was identified as a partial mediator for change in the group in terms of the ability to problem-solve.

**Conclusions:** Psychoeducation can have a positive effect on variables connected with cognitive representation of illness. Some personality variables can have an influence too. Both findings require further assessment in studies on larger groups, where clinical data should also be included in the analyses.

### bipolar disorder, psychoeducation, cognitive representation of illness

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Psychoeducation is currently considered an essential element of bipolar disorder treatment. Its efficacy has been shown in numerous studies [1,2]. It can be applied both on its own and as a basic element of other forms of psychosocial treatment [3]. One of the issues which require further study is the mechanisms behind psychoeducation and the clinical and personality characteristics of its recipients [4]. There is no doubt

that the introduction of regular daily routines and early identification of recurrences are fundamental factors [5], but the question remains of what mechanisms should psychoeducation activate to encourage those health-promoting behaviors in patients. Scott & Tacchi point to the so-called cognitive representation of illness as a possible factor [6]. In an earlier study, we have shown that psychoeducation can modify the way patients think about their condition and the situation associated with it [7]. However, so far there has been no systematic assessment of the influence of personality variables on the efficacy of psychoeducation programs.

## SUBJECTS

An initial invitation to take part in the study was issued to patients treated for bipolar disorder in an out-patient hospital clinic and at other clinics in the city by doctors who were informed about the program. Patients qualified for the study at an appointment with one of the researchers.

The inclusion criteria were: (1) diagnosis of bipolar disorder according to DSM-IV, validated by the Mini International Neuropsychiatric Interview (MINI) questionnaire and a clinical assessment (the diagnosis was confirmed when both methods showed consistent results); (2) functional remission, which was a condition for taking part in the study, assessed by the qualifying researcher; (3) informed written consent to take part in the study. The exclusion criteria were: (1) lack of consent to take part; (2) a recurrence of the illness making it impossible to continue the program; (3) severe limitations to cognitive-intellectual functioning (intellectual disability, dementia). Additionally, patients who missed more than two out of the eight planned psychoeducation sessions were excluded from statistical analysis. Initially, 40 consecutive patients were included in the study: the first 20 forming the study group and the following 20 the control group. The final statistical analysis includes 14 patients from each group who have completed the program. The two groups did not differ in terms of basic demographic data or clinical variables (Table 1), or in terms of basic personality dimensions (Table 2).

**Table 1:** Descriptive characteristics for demographic data and basic information about the illness in the study sample

	Study group	Control group	p
Place of residence			
City <50000	4 (28.6%)	5 (35.7%)	0.500
City >50000	10 (71.4%)	9 (64.3%)	
Education			
Higher	9 (64.3%)	10 (71.4%)	0.500
Other	5 (35.7%)	4 (28.6%)	
In work			
Yes	10 (71.4%)	8 (57.1%)	0.430
No	4 (28.6%)	6 (42.9%)	
Age at onset of mood disorder: years, range (mean ± SD)	13–55 (29.14±12.54)	13–40 (25.79±7.73)	0.402
Age at bipolar disorder diagnosis: years, range (mean ± SD)	21–57 (33.43±10.88)	19–63 (34.79±11.42)	0.750
Age at start of bipolar disorder treatment: years, range (mean ± SD)	21–57 (33.5±10.91)	19–63 (35.0±11.29)	0.724
Disorder phases, range (mean ± SD), Me (Q <sub>1</sub> -Q <sub>3</sub> )	2–45 (10.21±11.66), 5.5 (4.75–11.25)	2–30 (9.5±8.6), 7.5 (2.75–12.0)	0.910
Quick change of phases			
Yes	2 (14.3%)	3 (21.4%)	0.500
No	12 (85.7%)	11 (78.6%)	

Suicidal thoughts			
Yes	11 (78.6%)	9 (64.3%)	0.339
No	3 (21.4%)	5 (62.5%)	
Suicide attempts			
Yes	5 (35.7%)	4 (28.6%)	0.500
No	9 (64.3%)	10 (71.4%)	
Hospitalization			
Yes	10 (71.4%)	10 (71.4%)	0.999
No	4 (28.6%)	4 (28.6%)	
Age at first hospitalization: years, range (mean ± SD)	19–48 (30.10±8.40)	21–51 (33.4±8.55)	0.395
Number of hospitalizations, range (mean ± SD), Me (Q <sub>1</sub> -Q <sub>3</sub> )	1–5 (2.50±1.35), 2.5 (1.0–3.25)	1–7 (2.60±2.41), 1.0 (1.0–5.25)	0.579
Duration of longest hospitalization: days, range (mean ± SD), Me (Q <sub>1</sub> -Q <sub>3</sub> )	12–180 (68.70±47.87), 60 (33.25–90)	21–90 (44.90±23.71), 42 (27.75–52.5)	0.247
Comorbidity			
Yes	6 (42.9%)	4 (28.6%)	0.430
No	8 (57.1%)	10 (71.4%)	

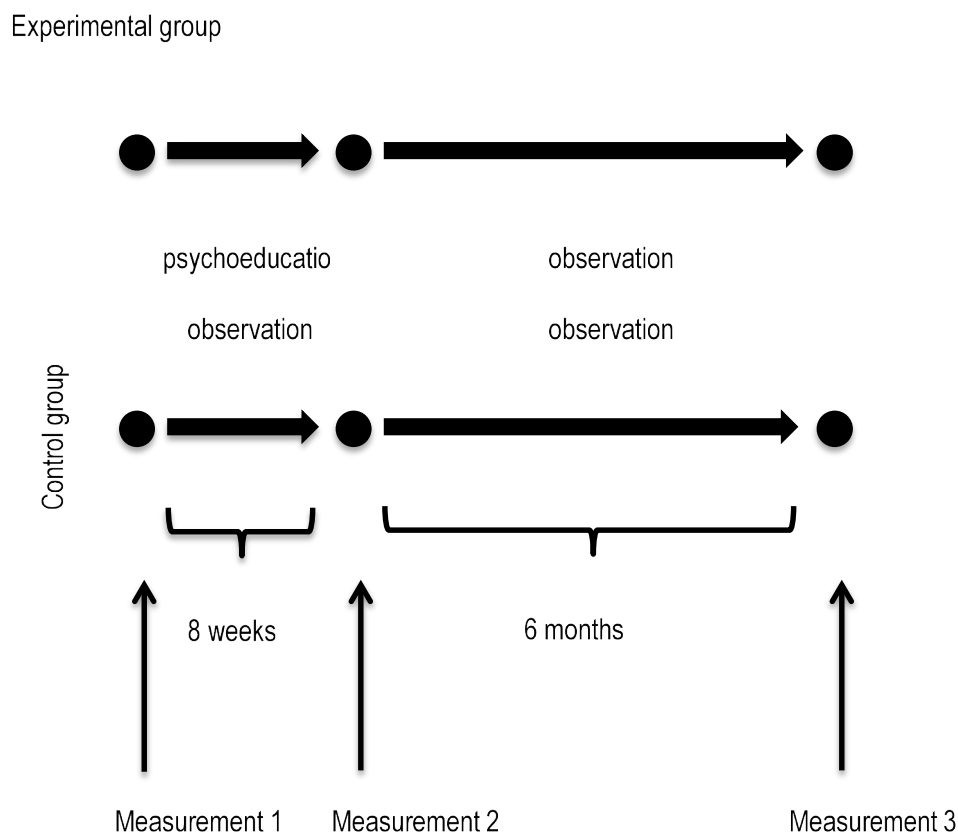
**Table 2:** Personality traits in the study sample

	Study group	Control group	
	Range (mean ± SD)		p
Neuroticism	10–37 (23.86 ± 8.45)	11–46 (25.0±10.42)	0.753
Extraversion	13–29 (17.93±4.53)	13–30 (21.07±6.01)	0.130
Openness to experience	22–41 (27.79±5.25)	16–38 (26.07±7.47)	0.489
Agreeableness	24–38 (30.93±4.45)	19–38 (29.21±5.45)	0.370
Conscientiousness	11–36 (25.0±7.67)	19–40 (29.36±6.16)	0.109

## METHOD

The study assessed the influence of group psychoeducation (independent variable) on cognitive representation of illness (dependent variable). Cognitive representation of illness was defined in terms of the following variables: acceptance of illness, locus of health control, generalized self-efficacy, hope for success and beliefs about bipolar disorder. Additionally, the possible mediating influence of basic personality dimensions on the effect of psychoeducation was assessed. The main aim of the study was to determine whether taking part in structured group psychoeducation influences the structure of cognitive representation of illness, and whether the participants' personality can have a mediating effect on the process. We assumed that both

hypotheses would be found true. The intervention used was a structured group psychoeducation program "Taming the bipolar affective disorder", which we have described in detail elsewhere [1,7,8]. It comprised eight 90-minute meetings, which combined lectures and workshops, over the course of 2 months. Both groups were assessed with the research tool three times: before the intervention in the study group (measurement 1), directly after the intervention (measurement 2), and 6 months later (measurement 3). Assessment with the MINI and NEO-FFI questionnaires was conducted only during the first meeting. After the study was concluded, group psychoeducation was organized for the control group. The recruitment for the study and the interventions for both groups took place in 2013–2014. The study timeline is shown in Figure 1.



**Figure 1:** The study timeline in the study group and the control group

## RESEARCH TOOLS

- Acceptance of Illness Scale (AIS)

A scale designed by B. J. Felton, T. A. Revenson and G. A. Hinrichsen, adapted for the Polish language by Z. Juczyński, AIS can be used for assessing the level of acceptance in any illness. It is a self-assessment tool. Reliability of the Polish version: Cronbach's alpha 0.82, Spearman's rho over 7 months 0.69 [9].

- Multidimensional Health Locus of Control (MHLC) scale

A scale designed by K. A. Wallston, B. S. Wallston and R. DeVellis and adapted for the Polish language by Z. Juczyński. It is a popular diagnostic tool, used in health-promoting programs as an element of preventive measures. It contrasts the internal locus of control (W) with the external locus of control, which distinguishes between the influence of others (I) and the influence of chance or fortune (P). The scale is based on the assumption that the internal locus of control facilitates health-promoting behaviors.

MHLC is a self-assessment tool. The reliability of the Polish version is 0.67 for the influence of others and 0.75 for the influence of chance [9].

- Hope for success questionnaire (KNS)

This is a questionnaire designed by M. Łaguna, J. Trzebiński and M. Zięba. It measures hope for success defined as expecting positive outcomes of one's actions. It consists of two components: belief in having a strong will (KNS-S) and belief in having the ability to find solutions to problems (KNS-UZR). A correlation has been confirmed between hope for success measured with KNS and the effectiveness of therapeutic interventions, as well as its facilitating role in dealing with difficult situations. The questionnaire is a self-assessment tool with satisfactory internal consistency and stability [10].

- Generalized Self-Efficacy Scale (GSES)

A scale designed by R. Schwarzer and R. Jerusalem and adapted for the Polish language by Z. Juczyński. It measures the generalized belief in self-efficacy in dealing with difficult situations and when faced by obstacles.

The sense of self-efficacy makes it possible to foresee intentions and actions in various spheres of human activity, including behaviors connected with health. It is a self-assessment tool. The reliability of the scale was assessed as Cronbach’s alpha 0.85, and the standard error of measurement is 0.24 [9].

- Questionnaire on beliefs about bipolar affective disorder

A questionnaire was created by the second author (G.M.) to test the beliefs patients have about bipolar affective disorder and its treatment. It is a self-assessment tool.

- Mini International Neuropsychiatric Interview (MINI)

A standardized diagnostic interview which facilitates the diagnosis of mental disorders according to DSM-IV and ICD-10 criteria. It has been translated into many languages, including Polish [11].

- NEO-FFI questionnaire

NEO-FFI is an inventory, enabling data collection on five basic personality traits: neuroticism (N), extraversion (E), openness to experience (O), agreeableness (A) and conscientiousness (C). It has been translated into Polish and normalised after psychometric assessment [12].

**STATISTICAL METHODS**

The description of continuous features was based on mean values, along with standard deviations and minimum and maximum values.

Discretized data were presented in terms of numbers and percentages. To compare the average values for continuous features in two different populations, Student’s *t*-test was used for unrelated variables where all its conditions were met, that is the studied feature showed normal distribution in both populations (the Shapiro–Wilk test) and the equality of variances (Levene’s test). Where the first condition was not met, the Mann–Whitney *U*-test, a non-parametric counterpart of the Student’s *t*-test, was used for analysis. Where the second condition was not met, the analysis was based on the Welch’s *t*-test. The correlation of two qualitative features was verified with a chi-squared test or, where the expected numbers were too low (i.e. lower than 5), the Fisher’s exact test. Two-way analysis of variance for the repeated measures was used to determine changes in mean values during the study (at three points in time) in both groups. Where statistically significant results were obtained, *post-hoc* Tukey’s tests were performed.

Results were considered statistically significant if the obtained *p*-values did not exceed the significance level of 0.005. The calculations were made with STATISTICA v.10 (StatSoft Inc., Tulsa, OK, USA).

**RESULTS**

Statistically significant differences between measurements in the groups were found for the variables: MHLC-W, MHLC-P, KNS-UZR, GSES, and for the questionnaire on beliefs, as shown in Table 3. The significance was then confirmed in *post-hoc* tests for the following:

**Table 3:** Comparison of mean scores from questionnaires in consecutive measurements in both groups

	Study group measurement Range (mean ± SD)			Control group measurements Range (mean ± SD)			p
	1	2	3	1	2	3	
MHLC-W	16–35 (25.21±4.69)	19–34 (28.71±5.21)	13–33 (26.71±6.09)	15–33 (24.43±4.42)	14–32 (24.00±4.21)	16–33 (24.43±4.13)	0.003
MHLC-I	15–33 (24.29±6.23)	18–35 (25.21±4.68)	18–34 (25.29±3.91)	15–36 (24.29±5.98)	18–33 (24.43±4.43)	18–36 (25.50±4.84)	-
MHLC-P	8–30 (18.79±5.25)	6–32 (15.57±7.12)	11–25 (15.64±4.52)	10–31 (19.07±6.99)	12–30 (20.07±5.93)	14–32 (21.14±5.72)	0.007

AIS	9–39 (26.86±8.96)	14–40 (28.64±7.34)	11–40 (28.3±68.34)	14–37 (24.57±7.76)	10–35 (23.71±7.97)	11–35 (24.00±7.99)	-
KNS total	43–72 (59.50±9.16)	47–76 (62.14±9.26)	48–76 (62.71±7.81)	48–89 (64.00±10.99)	50–77 (63.86±8.27)	50–75 (63.57±7.44)	-
KNS-UZR	14–28 (22.14±4.94)	15–31 (25.21±5.09)	19–30 (24.64±3.46)	16–32 (22.71±5.08)	16–32 (22.79±5.10)	14–33 (22.00±5.04)	0.048
KNS-S	7–29 (18.93±7.18)	12–31 (21.71±6.02)	11–29 (20.43±5.27)	10–32 (19.64±6.82)	8–30 (20.21±6.40)	8–31 (20.14±1.74)	-
GSES	17–34 (26.36±5.17)	19–38 (28.93±5.05)	23–34 (27.71±3.43)	14–32 (25.14±5.45)	15–32 (24.57±4.80)	16–31 (24.43±4.47)	0.033
BEL	229–327 (263.00±28.26)	277–326 (308.79±14.56)	287–320 (300.57±25.18)	219–309 (274.50±30.01)	277–326 (308.79±14.56)	248–330 (300.57±25.18)	<0.001

Notes: MHLC-W, Multidimensional Health Locus of Control Scale – internal factors; MHLC-I, Multidimensional Health Locus of Control Scale – influence of others; MHLC-P, Multidimensional Health Locus of Control Scale – influence of chance; AIS, Acceptance of Illness Scale; KNS, Hope for success questionnaire; KNS-UZR, Hope for success questionnaire – the ability to find solutions; KNS-S, Hope for success questionnaire – strong will; GSES, Generalized Self-Efficacy Scale; BEL, Questionnaire on beliefs about the bipolar affective disorder.

MHLC-W results for the psychoeducation group: the mean results in the study group directly after the psychoeducation program (measurement 2) were significantly different than before the program (28.71±5.21 vs. 25.21±4.69;  $p=0.01$ , *post-hoc* Tukey's tests), whereas the mean scores in the control group remained constant throughout the study, at about 24 points. No statistically significant difference was found between the results directly after the program and after the 6-month observation period ( $p=0.382$ , *post-hoc* Tukey's tests). This suggests that the beneficial effect of psychoeducation is a lasting one, although it seems to diminish with time.

KNS-UZR results for the psychoeducation group: the mean results in the study group directly after the intervention were significantly different to the results obtained before psychoeducation ( $p=0.038$ , *post-hoc* Tukey's tests). They remained constant in the control group, at about 22 points.

GSES results for the psychoeducation group: the mean results directly after the intervention were significantly different to the results obtained before ( $p=0.037$ , *post-hoc* Tukey's tests). In the control group the mean scores remained constant throughout the study, at about 24–25 points.

The results on the questionnaire on beliefs in the psychoeducation group: the mean results in the study group directly after the intervention and 6 months later were significantly different

to the results obtained before psychoeducation ( $p<0.001$ , *post-hoc* Tukey's tests) (Table 3).

Assessment of the mediating effect of the basic personality traits showed that they did not have a significant influence on the results of the study. The only partial mediator in the case of variables which changed significantly during psychoeducation was conscientiousness. It turned out to be a significant mediator for the KNS-UZR results before and after completing psychoeducation ( $p=0.048$ ). Not taking the influence of conscientiousness into account, the individual increase in the initial results of KNS-UZR causes an increase in the results after completing psychoeducation by about 0.565 points, whereas when conscientiousness is taken into account, the individual increase in the initial results causes a significantly greater change in the results after completing psychoeducation (by about 0.913 points).

## DISCUSSION

Taking part in group psychoeducation strengthened the internal locus of health control, hope for success expressed as an ability to find solutions to problems and a sense of self-efficacy in the participants, as well as having a beneficial effect on their beliefs about bipolar disorder. The positive influence of group psychoeducation seems to wane over time with regard to most of the studied aspects of cognitive representations of illness, but the change in the beliefs

about the illness may be more permanent, which is associated with the fact that participants have gained new knowledge.

### **Psychoeducation and the locus of health control**

The locus of health control is considered an important factor responsible for the way an individual deals with a serious illness [13,14]. Studies of patients suffering from somatic illnesses seem to suggest that internal locus of control is more beneficial from the point of view of patients' active participation in their recovery [9]. However, there have been few studies on the locus of health control and its role among patients diagnosed with bipolar disorders, and they have yielded contradictory results. The same holds true for studies on the influence of psychoeducation on this aspect. Some researchers believe that patients who cooperate poorly in treatment often display decidedly external locus of health control in contrast to patients who cooperate well [15,16], whereas others point to the greater ease in submitting to control from other people and greater dependence on others in patients who cooperate well [17,18]. French researchers observed that in patients diagnosed with bipolar disorders who took part in psychoeducation there was a significant increase in external locus of control, which was interpreted as a rise in trust towards healthcare staff [19]. However, in our earlier studies, which were based on the same intervention but conducted without a control group, we did not observe a statistically significant influence of psychoeducation on any aspect of locus of health control, even though the mean values for both internal and external locus of control in the participants increased [7]. The increase in the internal locus of control in the study group directly after the intervention in the present study may suggest a possibility of achieving a health-promoting change in this area.

### **Psychoeducation and hope for success**

The positive role of hope for success in dealing with illness has been noted in other stud-

ies [20,21]. However, there is an unmet need for studies which would look into this aspect in patients with bipolar disorders. In our earlier study without a control group, there was a 6.5% rise in the results of the KNS-UZR scale directly after psychoeducation [7]. Both the result we observed before and the change in this aspect observed in the present study point to the need for further studies which would analyze the relationship between observed changes and clinical variables.

### **Psychoeducation and generalized self-efficacy**

Some authors consider promoting a sense of self-efficacy one of the key aspects of treating chronic illnesses such as bipolar disorders, which strengthens the model of treatment based on therapeutic alliance [22]. In our previous study, psychoeducation contributed to an 8.3% rise in scores for the GSES [7]. Demonstrating the influence of psychoeducation on this aspect of the participants' experience in contrast to the control group again points to the importance of conducting further research in this area.

### **Psychoeducation and beliefs about bipolar disorder**

Our clinical observations and experience gained in leading psychoeducation group therapy have led us to believe that patients do not have sufficient knowledge on bipolar disorder. They often maintain false and dysfunctional beliefs about bipolar disorder [5,23]. At the same time, psychoeducation seems to affect the core of a cognitive representation of illness by providing relevant knowledge about the illness in a form that is easy to access and additionally supported by other participants' personal stories [7]. In the present study, we have also observed a change in the beliefs about bipolar disorder, towards beliefs that are more relevant and conducive to health.

### **Psychoeducation and personality**

Although the results of the study do not give any basis for assuming that basic personali-

ty traits described in the NEOAC (NEO-FFI) model mediate the effects of psychoeducation on the cognitive representation of illness, some may play a role. Conscientiousness may partly modify the beneficial influence of psychoeducation on the ability to problem-solve. This is understandable, assuming that persons scoring high for conscientiousness are characterized by strong will, motivation for action and perseverance in achieving their goals. They are considered meticulous, dependable and punctual [12]. One of the components of conscientiousness is competence, described as the belief in the possibility to do well in life [12]. However, because of the tools used and the size of the sample, it is impossible to determine whether this was the deciding factor. It is worth noting here the data which point to conscientiousness as a predictor of achievements in school or the effectiveness of psychotherapy. One interpretation is that low conscientiousness may be associated with the tendency to miss appointments or avoid work during therapy [12]. However, because of a small sample size the results achieved in the present study can only encourage further research into the significance of patients' personality for the effects of psychoeducation.

## CONCLUSIONS

The important limitations of the study include small sample size, limited representativeness of the sample for people suffering from bipolar disorder who receive psychiatric treatment and lack of insight into how changes in the cognitive representation of illness may correlate with any changes in the clinical data in the analyses carried out in the present study. The strength of the study is the assessment of the role played by basic personality traits in mediating changes in the cognitive representation of illness in a group who took part in psychoeducation, which constitutes an important step in studies on the mechanisms behind psychoeducation, as well as using an original psychoeducation program.

Taking into account the aforementioned limitations, we can tentatively form the following conclusions:

Psychoeducation may have an influence on important aspects of cognitive representation of

illness in patients with bipolar disorders. However, this requires further study with larger samples.

Further research should take into account and analyze in detail the influence of psychoeducation on clinical variables and the role of changes observed in the cognitive representation of illness play in this. In short, further research should help understand the mechanisms behind the clinical effects of psychoeducation.

Studies on the role of personality variables in the process of psychoeducation should be continued, which may make a better selection of candidates possible, as well as help formulating any contraindications for taking part in this form of treatment.

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