Psychiatr. Pol. ONLINE FIRST Nr 345: 1–15
Published ahead of print 20 May 2024
www.psychiatriapolska.pl
ISSN 0033-2674 (PRINT), ISSN 2391-5854 (ONLINE)
DOI: https://doi.org/10.12740/PP/OnlineFirst/185461

Changes in temperament, character and intensity of empathy in adolescents treated in a day care unit – pilot study

Renata Modrzejewska[1], Anna Wasik[1], Paulina Cofór-Pinkowska[2], Agnieszka Pac[3], Marcin Siwek[1]

[1] Department of Affective Disorders, Chair of Psychiatry, Jagiellonian University Medical College
[2] Department of Family Therapy and Psychosomatics, Chair of Psychiatry, Jagiellonian University Medical College
[3] Environmental Epidemiology Unit, Department of Epidemiology, Chair of Epidemiology and Preventive Medicine, Jagiellonian University Medical College in Krakow

Summary

Aim. The aim of this pilot study was to compare the level of empathy, temperament and character traits before and after 6 months of treatment in a group of patients staying in a psychiatric day care unit in groups with different (internalising vs. externalising) disorder types.

Material and method. The study was conducted in a group of 44 patients (33 girls and 11 boys), aged 15–20, treated between 2016 and 2021 in the Clinical Day Care Unit of the Department of Adult, Child and Adolescent Psychiatry of the University Hospital in Krakow. 40% of the adolescents had externalising disorders and 60% had internalising disorders. The *Davis Empathy Scale* and the *Cohen Empathy Scale* were used in the study, as well as the Cloninger' *Temperament and Character Inventory* (TCI).

Results. Six months of treatment in a day care unit resulted in statistically significant changes in the "Fantasy" scale from the *Davis Empathy Scale*, in the "Reward dependence", "Self-directedness" and "Self-transcendence" subscales on the *Temperament and Character Inventory* in the group of adolescents with internalising disorders. In the group of adolescents with externalising disorders, there were changes at the level of statistical trend in the values of the "Fantasy" scale and the "Harm Avoidance" scale of the *Temperament and Character Inventory*.

Conclusions. The obtained results are in line with the available data in terms of differences in temperament and character profiles between types of mental disorders and constellations of traits that are unfavourable for mental health, such as low self-directedness, harm avoidance and reward dependence.

Key words: temperament and character traits in adolescents, treatment-influenced changes in temperament and character, treatment-influenced changes in empathy

Introduction

Cloninger's psychobiological model assumes that temperament, revealed at an early stage of development, is expressed in four dimensions: novelty seeking (NS), harm avoidance (HA), reward dependence (RD), persistence (P), each linked to the activity of neurotransmitter systems (NS to low basal dopaminergic activity; HA to high serotonergic activity, RD to low basal noradrenergic activity). Character, on the other hand, is described by three dimensions – self-directedness (SD), cooperativeness (C) and self-transcendence (ST) – and is subject to changes over time in the process of human individuation [1]. According to this model, genetically and neurobiologically conditioned temperament traits remain stable throughout life, while character traits change with age: among other things, a reduction in novelty seeking is observed starting from middle adulthood [2]. Research into the development of temperament and character throughout life has resulted in observations about constitutional differences between the general population and psychiatric patients, and about changes in temperament and character with age. The relevance of individual temperament and character traits to the development of maladaptive behaviour and psychiatric disorders in adolescence and adulthood has also been described, including the type of disorder.

In 1966, Thomas Achenbach proposed a division of behavioural disorders in children and adolescents into internalising and externalising disorders. Externalising disorders include behavioural difficulties related to aggression, antisocial, oppositional and defiant behaviour subject to poor control. Internalising disorders, on the other hand, include anxiety-depressive symptoms, somatic symptoms, withdrawal, difficulties in the course of an abnormally formed personality [3]. The present study uses the above typology. Numerous studies have observed a distinctive intensity profile of temperament and character traits for internalising and externalising disorders: higher intensity of harm avoidance in internalising disorders, higher novelty seeking in externalising disorders [4], higher intensity of harm avoidance and lower intensity of self-directedness in internalising disorders, significantly lower cooperative abilities in externalising disorders [5], higher harm avoidance in internalising disorders, higher novelty seeking in externalising disorders, no significant differences in cooperativeness, self-directedness or persistence [6].

Trouillet and Gana [2] investigated the potential relationship between the intensity of temperament and character traits described by the Cloninger model and the intensity of depressive symptoms. The study involved 466 subjects, from four age groups (18–94 years). It was shown that the intensity of self-transcendence and harm avoidance was a predictor of depressive symptom severity, i.e. the greater the self-transcendence and the lower the harm avoidance, the lower the severity of depression. Furthermore, the study showed that impulsivity, curiosity and social dependence decrease with age, while spirituality increases [2]. Zappitelli et al. [7] compared the intensity of character traits and temperament in children and adolescents aged 8–17 diagnosed with a major depressive disorder and healthy volunteers of the same age.

They showed that the clinical group displayed lower intensity of reward dependence, persistence, self-directedness, and cooperativeness, as well as higher harm avoidance and novelty seeking. Results of other studies suggest that patients with mood disorders have significantly lower intensity of self-directedness and cooperativeness than the general population, among other things [8, 9]. Ardani et al. [10] assessed the intensity of temperament and character traits that are conducive to suicide attempts in 140 subjects aged 14–35 (with non-lethal suicide attempts by drug intoxication). The study found that lower levels of self-directedness and persistence as well as higher levels of self-transcendence compared to the control group were conducive to suicidal behaviour. In a study by Tschan et al. [11], it was observed that patients with a history of self-harm had lower levels of self-directedness, persistence and cooperativeness, and higher levels of novelty seeking and harm avoidance. In conclusion, adolescents suffering from behavioural and emotional disorders are observed to have high levels of harm avoidance, novelty seeking, while low levels of self-directedness, persistence or reward dependence may contribute to the risk of behaviour or emotion/mood disorders resulting in refusal to attend school, self-harm or suicide attempts.

Empathy, or the ability to share emotional states with other people, as proposed by Davis [12], can be broken down into affective empathy (described by emotional concern or a sense of personal distress about another person's situation) and cognitive empathy (ability to take other people's perspectives, imagine being in their position). Empathy can be both a protective factor and a risk for the development of mental disorders in children and adolescents [13]. Research results suggest that both reduced and increased levels of empathy compared to the general population may contribute to the development of mental disorders. A study by Galán et al. [14] found that the lower the level of empathy in childhood and early adolescence, the higher the likelihood of antisocial behaviour in late adolescence and early adulthood. Gambin and Sharp's study [15] of adolescents aged 12–17 found that the higher the intensity of affective empathy, the higher the intensity of anxiety symptoms (i.e. separation anxiety, rejection anxiety, panic anxiety, and humiliation anxiety). An inverse relationship was observed for cognitive empathy: the better the ability to infer other people's states of mind, the lower the anxiety symptoms. In contrast, an inverse relationship was observed for externalising disorders – conduct disorders were negatively correlated with the intensity of cognitive and affective empathy [15]. According to research, empathy varies in intensity depending on the disorder profile – in disorders described as internalising adolescents and adults exhibit aggressive behaviour, problems with the law and poor impulse control.

The aim of this study was to describe potential changes in character traits, temperament and intensity of empathy in adolescent day care patients hospitalised for severe depressive, anxiety-related or aggression-related symptoms that disrupt their social and mental functioning after six months of therapeutic interventions such as: individual therapy, group therapy, therapeutic community, social skills training within the day care unit.

Material and method

The study included 44 adolescents treated at the Day Care Unit of the Department of Adult, Child and Adolescent Psychiatry of the University Hospital in Krakow between 2016 and 2021 with a diagnosis of internalising and externalising disorders. The group of patients with internalising disorders included patients with depressive-anxiety symptoms. The group of patients with externalising disorders included subjects with oppositional defiant disorders and conduct disorders. As one of the inclusion criteria for the study, the initial diagnosis was assessed by a child and adolescent psychiatry specialist who qualified the patients for treatment at the unit. The diagnosis was verified in the following weeks of treatment, during psychiatric consultations. The criteria for exclusion from treatment in the day care unit structure, as well as for exclusion from the study, were: severe conduct disorder, psychoactive substance dependence, acute psychotic episode, eating disorders with BMI below 16, intellectual disability. The study involved 33 girls and 11 boys aged 15–20. The respondents were students of Krakow secondary schools.

Participants completed the Cohen and Davis empathy questionnaires as well as TCI at two time points: in the first two weeks of admission and then six months later. During the six-month investigation period, in addition to compulsory school attendance, the patients received an intensive therapeutic programme (therapy group twice a week, therapeutic community three times a week, individual therapy, sociotherapy) and pharmacotherapy. Each patient and their families received information about the purpose, method and duration of the study. Written consent for the questionnaire study was obtained from each adult patient and, in the case of minors, also from their parents.

Scale descriptions

Davis Empathy Scale

The *Davis Empathy Scale* (*Interpersonal Reactivity Index* – IRI) was developed by Mark H. Davis to study empathy understood as a multidimensional construct [16]. The questionnaire includes 4 scales: “Fantasy” (F), “Perspective Taking” (PT), “Empathic Concern” (EC) and “Personal Distress” (PD), each consisting of 7 items (for a total of 28 items). The PD and EC scales measure the affective aspect of empathy, perspective taking is considered a complex cognitive process, while the placement of the F scale on the ‘affective/cognitive’ dimension is not clear. It is designed to measure the tendency to imagine oneself as characters in films and books.

Cohen Empathy Scale

The *Cohen Empathy Scale*, also known as the *Cambridge Behaviour Scale*, is a questionnaire for measuring the empathy quotient (EQ) by Simon Baron-Cohen and Sally Wheelwright in the Polish translation by Agnieszka Wainaina-Woźna (down-

loaded from the Autism Research Centre website) [17]. Like the IRI, it measures the emotional and cognitive dimensions of empathy. The respondent's task is to respond to 40 statements by determining how true each statement is in their case. The EQ is a scale developed with clinical implications in mind, unlike many tools that existed before it. It is used to detect underdevelopment or lack of empathy which is a feature of psychopathology.

TCI questionnaire scales

The *Temperament and Character Inventory* (TCI), which is an operationalisation of Cloninger's psychobiological model of personality, is a battery of scales used to measure various dimensions of temperament and character [1]. It consists of 240 statements with one of two possible answers for the subject to choose: "true" or "false". The fourteen items of this questionnaire do not form part of any of the scales and are intended by the creators of the method to provide a basis for estimating the probability of the subject presenting with personality disorders. Thus, the actual questionnaire consists of 226 items.

The TCI measures the following four basic temperament dimensions:

(a) novelty seeking – a tendency to actively respond to new stimuli. The novelty seeking dimension consists of the following sub-dimensions: exploratory excitability (NS1) vs. stoic rigidity, impulsiveness (NS2) vs. reflection, extravagance (NS3) vs. reserve, and disorderliness (NS4) vs. regimentation;
(b) harm avoidance – the tendency to inhibit action in response to negative stimuli. The harm avoidance scale is a multidimensional higher-order temperament trait consisting of four sub-dimensions: anticipatory worry (HA1) vs. uninhibited optimism, fear of uncertainty (HA2) vs. confidence, shyness with strangers (HA3) vs. gregariousness, as well as fatigability and asthenia (HA4) vs. vigour;
(c) reward dependence – a tendency to sustain behaviour in response to positive reinforcement. Reward dependence is a multidimensional higher-order temperament trait consisting of the following three sub-dimensions: sentimentality (RD1) vs. insensitivity, attachment (RD2) vs. detachment and dependence (RD3) vs. independence;
(d) persistence – the ability to independently maintain a certain type of activity, including such behaviours as: responding positively to cues promising expected reward, intensifying work in response to occasional punishment and sustaining behaviour in response to the appearance of reward;
and the following three character dimensions which measure personality traits acquired during personal development:
(e) self-directedness – a person's ability to control, regulate and adjust their own behaviour in order to adapt to the situation. Self-directedness is a higher-order multidimensional character trait consisting of the following sub-dimensions: responsibility (SD1) vs. blaming, purposefulness (SD2) vs. lack of goal di-

rection, resourcefulness (SD3), self-acceptance (SD4) vs. self-striving and congruent second nature (SD5);

(f) cooperativeness – a person's ability to identify and accept the behaviour of others. Cooperativeness is a higher-order multidimensional character trait that consists of the following five sub-dimensions: social acceptance (C1) vs. social intolerance, empathy (C2) vs. social disinterest, helpfulness (C3) vs. unhelpfulness, compassion (C4) vs. revengefulness, and integrated conscience (C5);

(g) self-transcendence (the ability to detach from oneself) – a person's sense of being part of the universe (this dimension is related to spirituality). Like the other character dimensions, self-transcendence is also a higher-order multidimensional trait consisting of three sub-dimensions: self-forgetfulness (ST1) vs. self-conscious experience, transpersonal identification (ST2) vs. self-isolation and spiritual acceptance (ST3) vs. rational materialism.

Statistical analysis

The distributions of the variables (scores of the individual scales) were described using mean values and standard deviation (SD) as well as median. Comparisons of individual scale scores at the start of treatment and after 6 months of treatment were made using the Anova test for repeated measurements. The statistical analysis was performed using the SPSS bundle ver. 26 (IMAGO PRO 6, Predictive Solutions Sp.z o.o.). Correlations with $p < 0.05$ were considered statistically significant.

Results

Descriptive statistics

The study involved 44 respondents, aged 15–20 (mean 16,9), 41% ($n = 18$) of them had externalising behaviour disorders, 59% ($n = 26$) met the criteria for internalising disorders. In the study, 25% of respondents ($n = 11$) were boys, 75% ($n = 33$) were girls. The subjects were exposed to pharmacotherapy adapted to the observed symptoms. 100% of patients diagnosed with internalising disorders received antidepressants, among patients with externalising disorders it was 66.7%. A similar percentage of patients with internalising (69.2) and externalising (61.1%) disorders received neuroleptics (N). A small percentage of patients from both groups: internalising and externalising disorders took psychostimulants (PS) (11.5% and 16.7%, respectively) (Tab 1).

Table 1. **Psychopharmacotherapy among patients with internalising and externalising disorders**

	Internalizing disorders	Externalizing disorders
Sex		
Female	21 (80.8 %)	12 (66.7 %)
Male	5 (19.2 %)	6 (33.3 %)
Age		
Mean age	16.73	17.17
Psychiatric medication		
LD	5 (19.2%)	2 (11.1%)
N	0	3 (16.7%)
PS	0	
LD + N	12 (46.2%)	4 (22.2%)
LD + PS	1 (3.8%)	1 (5.5%)
LD + N + PS	2 (7.7%)	2 (11.1%)
LD + N + MS	5 (19.2%)	2 (11.1%)
Without treatment		3 (16.7%)

LD – antidepressants; N – neuroleptics; PS – psychostimulants; MS – mood stabilisers

Changes in intensity of the TCI and empathy scales

Figure 1 shows the changes in the intensity of temperament and character traits between the first and second measurements.

Changes in the intensity of temperament traits

Analysis of the Anova test results for repeated measurements showed a statistically significant change in the intensity of the reward dependence scale (RD3) in adolescents with internalising disorders. The scale value decreased in a statistically significant way between the first and second measurements (by 0.65 ± 1.4; $p < 0.05$). There was also an increase in the other two reward dependence scales RD1 and R2 between the first and second measurements, of 0.61 ± 1.6 and 0.92 ± 2.5, respectively, at the level of statistical trend.

There were no statistically significant differences in the intensity of temperament traits in adolescents diagnosed with externalising disorders. However, a decrease in

the intensity of one of the HA1 harm avoidance scales was observed between the first and second measurement of 0.63 ± 2.3 at the level of statistical trend ($p = 0.07$).

Changes in intensity of character traits

The analysis of the results for repeated measurements indicated a statistically significant change in the intensity of two character subscales, self-transcendence (ST2) and self-directedness (SD2), between the first and second measurement points in the subgroup of adolescents with a diagnosis of internalising disorder. The scale values increased in a statistically significant manner by 0.92 ± 0.5 ($p < 0.05$) and 0.65 ± 0.29 ($p < 0.05$), respectively. There were no statistically significant differences in the intensity of character traits in adolescents diagnosed with externalising disorders. However, a slight decrease (of 0.5 ± 1.3) in the C5 scale value was observed at the level of statistical trend ($p = 0.08$) in this subgroup.

Changes in the level of empathy

Analysis of the Anova test results for repeated measures showed a statistically significant change in intensity on the "Fantasy" scale of the Davis Empathy Scale in the subgroup of patients with internalising disorders. A statistically significant increase in empathy measured on the "Fantasy" scale between the first and second measurements (of 2.6 ± 4.6; $p < 0.05$) was observed. In the subgroup of adolescents with externalising disorders, there was an increase of 2.1 ± 4.45 in "Fantasy" Scale intensity at the level of statistical trend ($p = 0.08$).

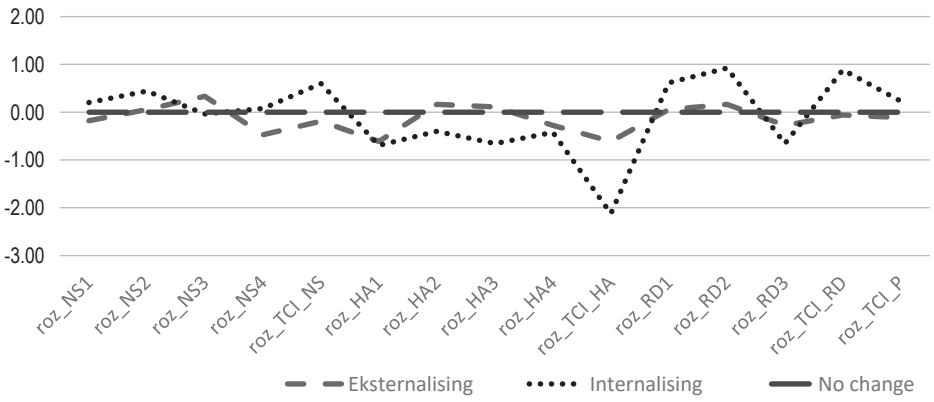

Figure 1. **Changes in intensity of temperament and character traits in internalising and externalising disorders between the first and the second measurement**

Discussion

Changes in temperament and character

In the study, significant changes in temperament and character traits were observed in adolescents after six months of treatment in a day care unit structure. There was a significant increase in the intensity of self-directedness and self-transcendence, changes in three dimensions of reward dependence (at the level of statistical trend for two of the three: sentimentality vs. insensitivity and attachment vs. detachment) in adolescents with a diagnosis of internalising disorder. These results describe significant changes for the health and development of adolescents with depressive-anxiety symptoms – an increase in purposefulness of action (increase in SD2), transpersonal identification, i.e. experiencing oneself as part of a community (ST2), an increase in friendliness, empathy, showing emotions (increase in RD1), attachment to other people (increase in RD2), and greater self-reliance and ability to rely on oneself (decrease in RD3).

The obtained results partly correspond to reports from the literature on the impact of treatment on temperament and character traits in adolescents and adults. A study by Lyoo et al. [18] is one of many to support the thesis that changes in character traits may be a result of the applied psychotherapeutic treatment, while changes in temperament traits may be a result of pharmacotherapy. In the present study, participants treated in the day care unit structure were exposed to intensive individual and group psychotherapy as well as pharmacotherapy, which may explain changes in temperament and character. Patients were mainly taking antidepressants and antipsychotics, less frequently psychostimulants or mood stabilisers. Their impact on changes in the levels of empathy, character traits and temperament could not be analysed in detail due to the too small study group.

In the described study, patients treated in the day care unit exhibited significantly higher levels of self-directedness after six months of treatment. The studies cited before indicate a correlation between low self-directedness and self-harm, including suicide attempts. In addition, patients treated for behavioural and emotional disorders are characterised by low levels of self-directedness [19–21]. An increase in self-directedness may be a protective factor against self-harm and may result in better adjustment, lower risk of mood disorders and greater emotion regulation. A prospective study by Cloninger et al. [22] conducted in a group of 631 patients assessed the effect of character and personality traits on the prediction of the occurrence of mood disorders over a 12-month period. The study found that baseline levels of harm avoidance and self-directedness would explain approx. 52% of the variance in changes in depression intensity at 12 months into the study. Research also shows that self-directedness is an important marker of executive functions, which are a protective factor for depression. On the other hand, harm avoidance is a marker of emotional susceptibility to depression [22].

In the present study, an increase in two dimensions of reward dependence, such as higher sentimentality and attachment, and lower reward dependence, was observed

under the influence of the applied treatment. Based on the description of the scales proposed by Cloninger, the obtained results can be described as follows. On the one hand, patients with internalising disorders became more sensitive, empathetic and connected to others, and on the other hand, more independent and self-reliant. A meta-analysis by Miettunen and Raevuori [23] involving 75 studies comparing temperament and character traits between patients with psychiatric disorders (nine diagnoses) and a control group showed a difference in the intensity of reward dependence. In patients diagnosed with depressive disorders, the intensity of reward dependence was statistically significantly lower than in healthy volunteers. In anxiety disorders, a similar effect was observed, but without reaching statistical significance [23].

A neuroimaging study conducted in a subpopulation of 72 adolescents aged 9–14 suffering from anxiety disorders showed a different pattern of brain activity in a task which assessed the response to winning and losing in functional magnetic resonance imaging, in the subgroup of patients who responded to therapy and non-respondents. Although no significant differences in striatal and prefrontal cortex activity were observed between the clinical group and the control group during the fMRI task, significant differences were observed between the therapy-responsive and non-responsive groups. In patients who responded to therapy, significantly greater activity was observed in the anterior cingulate cortex and the semi-lateral nucleus accumbens. In the cited study, the changes were related to the main reward dependence scale rather than its components [24]. Although there is no reference to a control group in the pilot study, the cited research allows us to assume that treatment in the day care unit brings the subjects' functioning closer to a healthier and more mature one and increases the potentially reduced reward dependence.

The study did not show changes in the level of harm avoidance or novelty seeking in the group of patients with internalising disorders. This can be explained as follows. Novelty seeking is elevated in self-harm adolescents [11, 25], those using psychoactive substances [26], having unsuccessful suicide attempts or with conduct disorder (oppositional defiant disorder) [20]. Lower intensity of novelty seeking was reported for patients with anxiety disorders (e.g. OCD) compared to patients with recurrent mood disorders [27], and in female patients with eating disorders engaging in self-harm for non-suicidal purposes [19]. In the light of the referenced studies, high novelty seeking intensity is significantly linked to the occurrence of externalising disorders. The novelty seeking dimension is thought to be mediated by the dopamine system, whereas harm avoidance is mediated by the serotonergic system. As expected, the present study showed no significant change for novelty seeking in the group of patients with internalising disorders. No changes were observed in the group of patients with externalising disorders either, although this was to have been expected.

One of the significant changes described in the study was an increase in self-transcendence ("Transpersonal Identification" scale) in adolescents with internalising disorders. The data on this topic are not conclusive. Some of the available research suggests that higher values of self-transcendence contribute to attributing the responsibility

for one's life more to superior forces, being less capable of withstanding frustration and being more at risk of suicide attempts [10, 28]. On the other hand, Trouillet and Gan's study [2] showed that it is high self-transference that is positively correlated with lower severity of depressive symptoms.

In the study described here, no statistically significant changes were found in the intensity of temperament and character traits in adolescents treated for externalising disorders. However, a decrease at the level of statistical trend in one of the harm avoidance scales was observed in this subgroup of patients. A study by Kim et al. [29] showed that in the group of studied adolescents, the presence of symptoms from the group of externalising disorders was statistically significantly correlated with high levels of harm avoidance and novelty seeking. The lack of significant changes can also be explained by the type of used interventions. Treatment in the day care unit was based primarily on psychodynamic, psychoanalytical or systemic psychotherapy. Studies show that this type of therapy is more effective for internalising disorders than it is for externalising disorders. Weitkamp et al. [30] compared the effectiveness of psychoanalytic psychotherapy (65 sessions) in a group of patients with externalising disorders with a control group (patients waiting for psychotherapy who have supportive therapy sessions). After 25 sessions (6 months), no significant differences in efficacy were observed between the two groups. One year later, the group who received psychoanalytic therapy showed a significant reduction in externalising symptoms as reported both by patients and their parents [30]. The small size of the group with externalising disorders did not allow the identification of subgroups in terms of different response to treatment. Increasing the size of the study group and extending the follow-up time will allow us to test the extent to which the applied treatment can significantly affect temperament and character traits in adolescents treated for externalising disorders.

The surprising result – a decrease in one dimension of cooperativeness (pure-hearted conscience) at the level of statistical trend in the group of patients with externalising disorders – can be explained as follows. The therapeutic work in the day care unit is geared towards expressing one's beliefs and emotions in order to work on them. It can be hypothesised that treatment at the day care unit did not reduce cooperation in adolescents with externalising disorders, however, decreased positive (false) self-presentation tendencies and increased openness in self-expression (including revealing inappropriate behaviour and its underlying motives). That said, this hypothesis requires verification.

Changes in the intensity of empathy

The study showed that the intensity of empathy on one of the scales ("Fantasy") increased in a statistically significant manner after six months of treatment in the adolescent day care unit in patients with internalising disorders. For externalising disorders, this scale showed an increase at the level of statistical trend. A comparison of the baseline level of empathy and changes after treatment between the clinical

group and the control group would allow a more accurate interpretation of the obtained results (exclusion of the impact of time on the increase in empathy among the studied adolescents). Nevertheless, the increase in empathy in psychiatrically treated adolescents described above is consistent with the results of other studies. Among other researchers, de Wied et al. [31] assessed changes in empathy levels in 90 adolescents treated in residential care for internalising disorders, externalising disorders, ADHD, oppositional defiant disorder, conduct disorder, and pervasive developmental disorders after six months of psychotherapy with 31 psychotherapists (in total). The researchers used the *Davis Empathy Scale* and the *Empathy Core Scale* to assess empathy. They treated the results of the "Fantasy" and "Perspective Taking" scales as a dimension of cognitive empathy and the results of the "Empathic Concern" and "Personal Distress" scales were an indicator of affective empathy. It was shown that there was an increase in cognitive empathy as a result of the therapy, the intensity of which, in turn, was positively correlated with the effects of therapy [31].

In the study described here, an increase in cognitive empathy was observed, as manifested by an increase in one of the scales ("Fantasy"). A study by Namba et al. [32] showed that, out of the *Davis Empathy Scale* subscales, only the "Fantasy" scale is a statistically significant predictor of empathic accuracy – i.e. the ability to respond empathically to other people. Its increase in adolescents treated for both externalising and internalising disorders may therefore be linked to being more ready than before to respond in social situations that require empathic understanding.

Conclusions

A number of studies with adolescents indicate that psychotherapy at developmental age contributes to better social functioning in children and adolescents. The results of the present study suggest that 6 months of psychotherapeutic and pharmacological treatment of adolescents in a day care facility may contribute to personality changes at the level of character traits and temperament as well as empathy in adolescents with internalising disorders, and to a lesser extent among adolescents with externalising disorders. The traits described in this study, i.e. an increase in reward dependence, self-directedness, self-transcendence, and cognitive empathy, are linked to greater responsibility for one's life and actions, greater involvement in interactions with other people or in psychotherapy, social adjustment and better emotional regulation.

Limitations of the study

The study presented here is a pilot for further research comparing changes in temperament, character and empathy intensity between adolescents receiving psychiatric treatment in a day care facility and the control group. An important limitation of the study is the lack of a control group – a comparison of the obtained results with those of healthy volunteers would make it possible to attribute the obtained changes

to therapeutic interventions, excluding the effect of time, which is one of the keys to the development of empathising skills. Another limitation of the study is the lack of information on the impact of the drugs on the obtained results. Patients took mainly antidepressants and antipsychotics, less frequently psychostimulants or mood stabilisers. Their impact on changes in the levels of empathy, character traits and temperament could not be analysed in detail due to the too small study group. This will be the subject of further analysis.

The study was carried out using own funds of Jagiellonian University Medical College (grant N41/DBS/000646). The study was conducted following approval of Jagiellonian University Medical College Bioethical Commission (no. 1072.6120.175.2021).

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Address: Renata Modrzejewska
Jagiellonian University Medical College
Chair of Psychiatry, Department of Affective Disorders
e-mail: renatam@cm-uj.krakow.pl