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COGNITIVE ABILITIES IN A PATIENT WITH ANOREXIA NERVOSA

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SUMMARY

Background:

The aim of our research was to examine the cognitive and intellectual functioning of a patient with anorexia nervosa, and to verify the persistence of cognitive functioning deficiencies five years after the regression of somatic symptoms of the disease.

Material/ Methods:

A 33-year-old patient with anorexia was examined. The following methods were used: the Wechsler Adult Intelligence Scale–Revised (WAIS-R[PL]); the Raven Matrices Test, standard version, classic form (TMS-K); the Coping in Stressful Situations Questionnaire (CISS); the Life Satisfaction Scale (SWLS); the DINEMO Emotional Intelligence Inventory; the SIE-T Emotional Intelligence Scale – Faces; the INTE Emotional Intelligence Questionnaire; the modified Figure Rating Scale; the Minnesota Multiphasic Personality Inventory (MMPI-2); and the patient's own pictures of herself 10 years ago, ill, and now, and of the family's living space.

Results:

The patient obtained divergent results in the intelligence tests: the WAIS-R (PL) was below average, but the Raven Matrices Test was average. The EQ, regardless of the applied method, was rated very low. Intellectual and cognitive functioning determines the functioning in the intrapersonal, interpersonal and praxeological spheres.

Conclusions:

Eating disorders affected this patient's intellectual and cognitive functioning permanently. Cognitive changes in perception, memory, attention, and intelligence were observed, as well as emotions and motivation.

Key words. *intelligence, cognitive functions, self-image, interpersonal relations*

INTRODUCTION

The dominant view in the literature is that anorexia nervosa is a psychosomatic illness (e.g. Banas et al., 1991), which suggests that human health is determined by cognitive functioning. The biological determinants of this disease cannot be ignored, either. However, both among those who associate anorexia with genetic determinants (e.g. Holland et al., 1988, cited by Pilecki, 1999), and those who favor an environmental etiology, as well as those who consider anorexia nervosa to be the result of abnormal hormonal control of satiety (where cholecystokinin and VIPS play a significant role, cf. Robinson et al., 1988, cited by Pilecki, 1999), psychosocial factors are taken into account, and regarded as a "trigger mechanism" evoking the disease. The multi-factor and multidimensional nature of anorexia (Claudio et al., 2006, cited by Grochmal-Bach et al., 2009), which combines the biological, individual, family and socio-cultural factors (Sumiła et al., 2006), has caused increased interest in the cognitive functioning of patients with anorexia nervosa, including a particular emphasis on intelligence and the functioning of personality. The results of research on this group of patients have not been conclusive. Some scholars describe altered functioning in patients with anorexia nervosa compared to patients without eating disorders (e.g. Duchesne et al., 2004, cited by Grochmal-Bach et al., 2009; Tchanturia, 2001; Wilson, 2006, cited by Cwojdzńska, 2007), while others do not find any differences (e.g. Śmiech, 2006). Some authors define the cognitive dysfunctions occurring in anorexia as "mild cognitive impairment," due to the fact that they do not have the same intensity as in serious organic disorders, and after successful rehabilitation and nutritional therapy they can be reduced or completely disappear (Salwach et al., 2009; Śmiech, 2006). The cognitive dysfunctions present in the course of anorexia, mainly stiffness of thinking (an impaired ability to change the active cognitive schema, including the image of one's own body) cause serious psychological consequences and seriously impede the course and successful completion of therapy (Wilson, 2006, cited by Cwojdzńska, 2007). Importantly, our own clinical observations indicate that the disorders in all these spheres persist even after the completion of therapy. However, no studies have been conducted on this issue.

For the purposes of the present study the authors paid particular attention to the interaction of intellectual and cognitive capacities with other spheres of life. Given the concept of Goleman (1997a, 1997b), three spheres of individual functioning were taken into account:

- psychological, understood as coping of an individual with himself;
- social – existing in interpersonal relations;
- praxeological, i.e. so called powers of action.

The intelligence level was also measured in the aforementioned spheres (IQ - the Intelligence Quotient, EQ – the Emotional Intelligence Quotient).

The aim of the research was to verify the cognitive – intellectual functioning of a patient with anorexia nervosa and verify the permanence of the cognitive functioning deficiencies within five years from the regression of somatic symptoms of the disease.

CASE SUMMARY

The patient, IS, 33 years of age at the time of examination, was 5 years after the withdrawal of the somatic symptoms of anorexia; however, as she herself declares, “you never stop being ill in the case of this disease.” The disease lasted for 2 years, and its onset coincided with the completion of the 5th and final year of the patient’s college studies. At the critical moment of the disease, with a height of 165 cm, she weighed 28 kg (BMI = 10.3, the fatal interval). As a result of exhaustion, the patient was admitted to the intensive care unit of the Medical Academy in Gdansk. She completed hospital treatment in 2004, at the age of 28 years. She left the hospital with a diagnosis of mitral valve insufficiency, bacterial endocarditis, *status post* ischemic stroke, left- hemiparesis, an ischemic lesion in the right cerebral hemisphere, speech disturbances (aphasia), anorexia, cachexia. The patient sought psychological help by her own initiative only at the end of hospitalization. She was motivated to “fight the disease” by her mother.

IS’s personality was tested with the Minnesota Multiphasic Personality Inventory (MMPI-2), and received the following profile:

- 5 ‘- 0 / 1 2 3 4 8: 9 6 7 L’ F - / F (Fig. 1).

It should be noted that I.S. tends to dissimulate and has an attitude oriented towards denying her problems and her weak points. It should be emphasized that she received a high score in Masculinity – Femininity, higher than the average for the profile, indicating difficulties in intimate relationships with the opposite sex and the lack of acceptance of her self-image as a woman. Apart from that, the patient obtained a high score in the Social Introversion scale, which indicates a low need to maintain interpersonal contacts and a tendency to isolate herself from other people, which results in social alienation, as well as a high score in the Hypochondria scale, which may indicate an excessive concentration on the image of her body. The results obtained confirm the data from the clinical history (see Fig. 1).

The patient’s intellectual and cognitive functioning was described first of all on the basis of a detailed analysis of the first sphere distinguished by Goleman, i.e. the psychological sphere (1997a, 1997b). This category includes the elements of self-awareness, self-esteem, self-control and the ability to cope with stressors. This sphere is particularly important for patients with eating disorders, because it is connected with the processes of perception. Patients with anorexia nervosa present with abnormalities in this process, which determines the lower level of psychological functioning (Józefik, 1999).

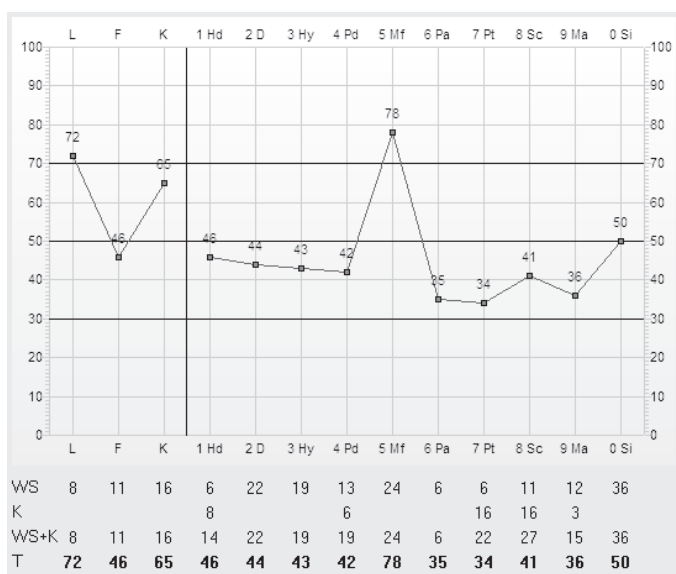


Fig. 1. IS's personality profile according to the *Minnesota Multiphasic Personality Inventory MMPI – 2*. Source: own materials

Self-awareness was diagnosed using the two-dimensional DINEMO Emotional Intelligence Inventory. In this study, the patient received a low score (the III standard ten in the "I" scale), indicating a lack of insight into her own emotional states and difficulty in understanding the cause-effect relationships of the experienced affects. IS does not interpret her own emotions, and as a result does not take them into account when making decisions in everyday life. Basing on the interview, it can be concluded that she has limited insight into her own personality. This was also confirmed by the INTE Questionnaire (the III standard ten), whose qualitative analysis provides the information that the patient has a tendency to avoid direct answers, generally preferring the alternative "it is hard to say." The methods used in the study show that IS has a low level of self-awareness. Brytek-Matera & Charzynska (2008) obtained similar results, indicating that patients with anorexia have mental and emotional deficits, which refer primarily to the inability to experience and express emotional states.

Low self-esteem, understood as a negative attitude towards oneself and the subjective perception of one's own lack of abilities by patients diagnosed with anorexia nervosa, is a predisposing factor that also maintains the disease (Brytek-Matera, 2007). In order to identify a group of subjective opinions and judgments about IS's attitudes and values, the SWLS Satisfaction with Life Scale was used, whose results revealed an average satisfaction with life (see Table 1). This result is consistent with that of several studies in the Polish literature (e.g. Brytek-Matera, 2007).

Table 1. Results from the Satisfaction with Life Scale (SWLS). Source: own materials

SWLS questions	IS's answers
My life is in many aspects close to an ideal.	I neither agree, nor disagree.
My living conditions are perfect.	I neither agree, nor disagree.
I am satisfied with my life.	I neither agree, nor disagree.
I have achieved in my life the most important things I have ever wanted.	I neither agree, nor disagree.
If I could live my life once again, I would not like to change much.	I rather disagree.

During therapeutic meetings, the patient was asked to draw herself from three temporal perspectives: Me as I was 10 years ago, Me as I was when I was ill, and Me as I am now (see Fig. 2a-b-c)).

A hermeneutic interpretation of these figures confirms the hypothesis about the impact of low self-esteem, conditioned by the subjective perception of one's own appearance, on the genesis of the symptoms of eating disorders. The dissatisfaction with body weight can be seen especially in the first diagram (Fig. 2a), where the patient marked the contours of her body with dotted lines, which may indicate a desire to lose weight, which is confirmed by the next drawing (Fig. 2b), where she is already at an advanced stage of the disease. Currently, IS presented herself as a full-figured woman compared with the period before the disease and during it (Fig. 2a and 2b), but the shapes are quite exaggerated. The patient began to accept her own body when the body mass index was in the lethal range (Fig. 2b), confirming that in the chronic period of the disease, patients suffering from anorexia are not only satisfied with their appearance, but are also proud of the results achieved (Brytek-Matera, 2008). During the interview the patient declared that the

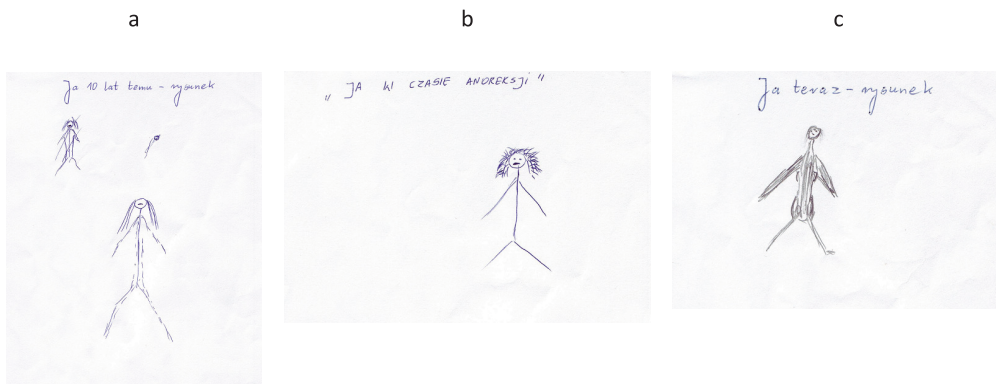


Fig. 2. Three pictures drawn by IS, presenting herself 10 years before onset (a), during the disease (b), and 5 years after the resolution of symptoms (c)

disease she suffered from was incurable. The current weight of the patient (53 kg) (Fig. 2c) may predispose to the renewal of symptoms. In addition, the discrepancy between the current image of her person and the ideal image of her body shape (Fig. 3) confirms this hypothesis. The perceptual and cognitive-affective aspect of body image perception induces a sense of low self-evaluation in the case of patients with anorexia (Wolska, 1999).

The Coping in Stressful Situations Questionnaire (CISS), connected with self-control and self-regulation, specifies the style of coping with difficult situations. The qualitative analysis of the results of this Questionnaire showed that IS prefers the task-oriented style. When she encounters a problem, IS focuses on it, analyses the situation before undertaking any actions, sets the direction and seeks to achieve the desired objectives. When she acts, she organizes the defined objectives in such a way that she maintains permanent control over the events. The available literature presents different conclusions, namely that anorectic patients often use avoidant coping strategies in stressful situations (using defensive mechanisms, such as denial and withdrawal) (e.g. Salwach et al., 2009; Brytek, 2006; Brytek-Matera & Charzynska, 2008; Wiatrowska, 2009), as well as emotional strategies in the form of seeking social support (Brytek, 2006). However, some authors have reported a task-oriented approach in patients with anorexia, particularly related to such behaviors as controlling weight, etc.

The second sphere distinguished by Goleman (1997a, 1997b) among the intellectual skills is dealing with social situations. This area is significant, because it relates to processes such as empathy, assertiveness, persuasion, leadership and cooperation. Śmiech & Rabe-Jabłońska (2006, cf. Kucharczyk-Pietura et al., 2006) indicate that patients with eating disorders are diagnosed to have significantly worse skills in recording emotional states, taking into account the sense of sight and hearing, especially with reference to negative emotions. In accordance with this hypothesis, people with anorexia have impaired social relationships, both family relationships and friendships, as well as general social contacts (Józefik & Ulańska, 1999; Sumiła et al., 2006). It is suggested in the literature that people with anorexia nervosa often exhibit an introverted attitude, which in effect makes it difficult to obtain social support both from family members, as well as those from the social surroundings (Salwach






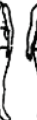
1	2	3	4	5	6	Figure	1	2	3	4	5	6
						Current self-image			x			
						Ideal self-image		x				

Fig. 3. The patient's answers in the modified Figure Rating Scale – (RFS) (Brytek-Matera, 2008; Stunkard et al., 1983)

et al., 2009). A limited number of interpersonal relationships, avoiding contacts with others, especially the opposite sex, and the lack of initiative leaves the patient alone with their problems and with difficulties in establishing intimate relations (Pilska & Jeżewska-Zychowicz, 2008). Wolska (1999) also points to the difficulties of such patients in dealing with their peers.

Currently it is believed that people with anorexia nervosa may use defensive mechanisms, which suggests that the negative image of other people may be a consequence of the projection of the negative image of oneself. In this way the distance kept by them in social relations is explained, as well as their isolation and interpersonal conflicts (Brytek, 2006). The DINEMO analysis (the III standard ten in the scale "Others") and the analysis of the SIE-T test confirmed these findings, showing that IS recognizes the emotions of other people inaccurately, and has no insight into the cause-and-effect relations of her emotional states. In addition, IS stated during an interview that she has no need to perceive or interpret the emotional states of others. In addition, she prefers to spend her free time alone, likes lonely holiday trips, and chooses those forms of leisure activities that do not require contact with another human being. The lack of social relationships is compensated by her family. When making a drawing of her family, the patient drew herself in the central position, suggesting that all of the family members are focused on her. A hermeneutical analysis of the family living space diagram (Fig. 4) shows

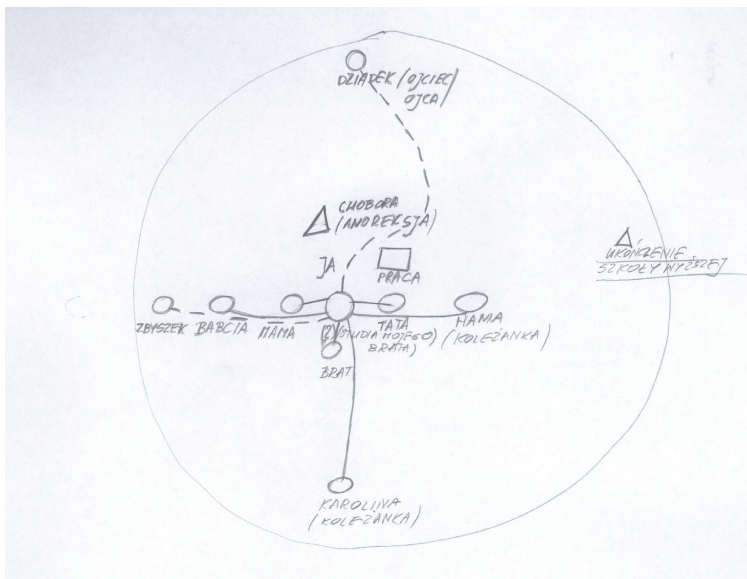


Fig. 4. The family living space drawn by the patient. Translation of labels: Dziadek (ojciec ojca) – Grandfather (father's father); Choroba (anoreksja) – Disease (anorexia); Ukończenie szkoły wyższej – College graduation; Ja – myself; Praca – Work; Zbyszek – Zbyszek (a male first name); Babcia – Grandmother; Mama – Mom; Studia mojego brata – My brother's college studies; Brat – Brother; Tata – Dad; Karolina (koleżanka) – Karolina (a friend); Hania (koleżanka) – Hania (a friend)

a close and strong relationship with the patient's closest family members, especially her mother. This shows that the disease, which is anorexia nervosa, is a cohesive factor in the family. In addition, the result of limited social relationships and the introverted attitude is that she is focused on work.

The most important element in the patient's life, in her own opinion, is to fulfill herself professionally. The personality profile of IS reveals high ambition and a particular need for success and achievement. Similar results have also been obtained in other studies, such as those conducted by Wolska (1999) and Meyer (2003).

During therapeutic sessions the patient was asked to describe her everyday activities (Fig. 5).

Analyzing the story written by the patient, the following personality traits become apparent: stiffness of thinking, schematic thinking, striving for excellence, reduced spontaneity, solidity, reliability, and conscientiousness. According to the literature these are typical characteristics of people with anorexia nervosa (e.g. Wolska, 1997; Meyer, 2003).

Another element distinguished by Goleman (1997a, 1997b) among mental abilities is the praxeological competence. The motivation to act and adaptive skills should be included here. The data found in the Polish and foreign

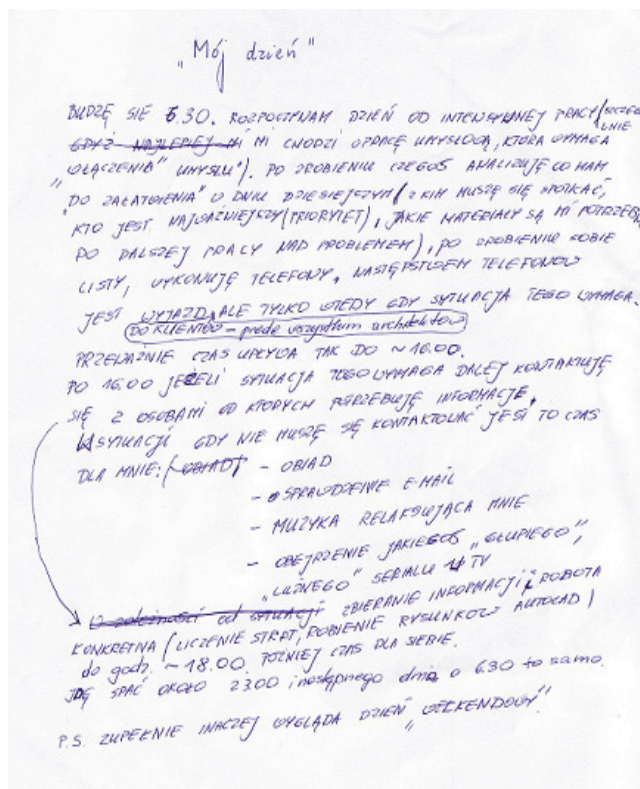


Fig. 5. A story written by IS, describing her everyday activities

literature are divergent if we analyse the intellectual functioning of patients with anorexia. The majority of studies on the intellectual functioning of people suffering from anorexia show that the average intelligence quotient (IQ) is higher than in healthy persons, and this difference is statistically significant (Blanz et al., 1997, cited by Śmiech & Rabe-Jablonska, 2006), or the general level of intellect of the clinical group is the same (Bayless, et al., 2002; McDowell et al., 2003; Murphy et al., 2002, cited by Śmiech & Rabe-Jablonska, 2006; Rajewski et al., 1996). There are also a few studies (e.g. Neumarker et al., 2000, cited by Śmiech, 2006) indicating that the IQ of the patients at the beginning of therapy is statistically lower in the non-verbal scale compared to the control group and the results obtained after the completion of therapy.

Based on an analysis of the results of the tests measuring the patient's IQ, we observed non-harmonic development. The WAIS-R test showed that IS has an IQ below average (84), with an 85% confidence interval; however, it should be noted that the result falls within the upper range. There is also a significant difference between the results of the verbal scale and the non-verbal scale in this test. The patient's IQ in the verbal scale is average (93), while in the non-verbal scale it is below average (83). The patient achieved the best result in the verbal scale in the Comprehension Subscale (14), thus demonstrating the capacity to understand and accept moral-ethical assessment, making use of past experience, and good long-term memory. By contrast, the lowest score obtained by the patient was in the verbal scale, in the Arithmetic Subscale (2), which suggests a limited capacity for logical reasoning. This subscale measures working memory and the focus of attention, which is very impaired in case of this patient. During the test IS declared problems with doing calculations in her head, and insisted on being given the opportunity to perform the task in writing. Observing the patient during the test and the therapeutic sessions, we noticed that she had a hard time reactivating and focusing her cognitive resources on the work at hand, and maintaining an optimum level of functioning. The patient was also susceptible to the influence of distracting factors.

IS achieved her highest score in the non-verbal scale in the Picture Ordering subscale (10), which indicates that she has the potential to reason logically via the visual channel; however, this ability is conditioned by the kind of material being processed. The lowest score in the non-verbal scale was achieved by the patient in the Puzzle test (5), which indicates limited spatial imagination and little ability to synthesize dispersed material.

In the Raven Matrices Test the patient obtained an average level of intelligence (grade III+, 75th percentile). At this stage it is also worth noting that the result is located close to the upper limit of the range. The discrepancy between the results of these two IQ indicators may result from the type of material being processed. The Raven Matrices Test is based on tasks oriented towards the visual channel, which allows the patient to visualize.

CONCLUSIONS

1. In the case of our patient with anorexia, impairment of intellectual and cognitive abilities was observed, even 5 years after the withdrawal of all somatic symptoms.
2. The deterioration of the individual's functioning refers to three spheres of existence: intrapersonal, interpersonal and praxeological.
3. In order to determine clearly the impact of eating disorders on the IQ, the discrepancies in the IQ before the disease and after the end of hospitalization should be measured.

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