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Self-Relationship of Codependent Women: Psychological and Genetic Predictors

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Abstract

Introduction. Self-esteem is a key aspect influencing psychological well-being and a potential target of therapeutic intervention in co-dependent women. Particular attention is paid to the role of reflection in the formation of self-esteem, as well as a possible link with genetic factors such as COMT and DRD2 genes. The aim of the study is to identify psychological and genetic predictors of the level of self-esteem in co-dependent women. Methods. Genotyping method was used to investigate genetic predictors. As candidate genes we considered the genotypes of dopamine receptor DRD2 (rs1800497) and COMT enzyme gene (Val158Met). Psychological diagnostics was carried out using the following techniques: test-questionnaire of self-relationship (V. V. Stolin, S. R. Pantileev); questionnaire "Differential type of reflexion" (D. A. Leontiev); test of meaning-life orientations (D. A. Leontiev); co-dependence scale (B. J. R. Winehold). The study involved 353 people - women aged 18 to 54 years. Results. The level of self-esteem in co-dependent women significantly differs depending on the genotypes of DRD2 and COMT genes, with the highest indicators in carriers of CC (DRD2) and VV (COMT) genotypes. The correlations between the indicators of self-esteem and reflexion and meaning-life orientations were revealed and described. The level of self-esteem in co-dependent women is associated with polymorphisms of DRD2 and COMT genes, as well as mediated by psychological factors, including meaningfulness of life and reflection. Discussion. Possible neurophysiological mechanisms underlying the identified effects include the influence of DRD2 and COMT gene polymorphisms on dopaminergic transmission; their

relationship with the level of self-esteem is described. The genetic basis of self-esteem is complex and multifaceted, and the role of individual genes can only be manifested in interaction with other genetic and environmental factors. The obtained data emphasize the complex interaction of genetic and psychological mechanisms in the formation of self-esteem.

Keywords

Co-dependent behavior, codependent women, self-esteem, psychological predictors, genetic predictors, gene polymorphism, COMT, DRD2

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Introduction

Co-dependency is a complex, heterogeneous and ambiguous phenomenon that has a long history of use by psychologists and psychiatrists to describe people living with dependent relatives, as well as some features of interpersonal interaction (Kolenova, Kukular, Dyatlova, 2023). Happ et al. (2022) concluded that co-dependency is a specific, largely stable attitude that determines a person's negative perceptions toward the self and positive behavior toward others. It has also been shown that the experience of co-dependency is experienced as a complex but tangible multidimensional psychosocial issue in their lives (Bacon et al., 2020). In general, generalization of practical experience of working with co-dependents, along with the data of modern research, indicates that the self-esteem of co-dependent women has its own unique specificity and is characterized by a highly underestimated level (Artemtseva, 2017; Balsamova, 2022; Zenkova, 2023; Kolenova, Kukular, Dyatlova, 2023; Raklova, 2019). This condition is determinant in the formation of the self-concept of the personality of a co-dependent woman. In the practice of real life, it is manifested through negativization of the self-image, constant request for praise and approval from significant others. At the same

time, praise and compliments to a co-dependent woman form only a greater sense of guilt. It is also shown that working with self-esteem and the development of self-understanding in the therapeutic process is one of the leading factors of positive dynamics of changes in co-dependent behaviors (Madalieva, Ismailov, Khalilov, 2020; Khazova, Varioshkina, 2022). It is shown that as a result of therapy there is a gradual reconstruction of women's personality: self-esteem and self-perception change, there is an awareness of one's own boundaries, and the style of thinking changes. This, in turn, determines a woman's attitude to herself as a source of activity, as well as a decrease in reactive behavior in connection with the problems of a dependent family member.

In studies devoted to interpersonal relationships of co-dependents in different contexts it is shown that co-dependents are characterized by personal-communicative orientation to the significant Other (Mikhailova, 2020), while alienating loneliness is characterized by the predominance of the tendency to isolation in the personality, alienation from other people, norms and values, loss of significant ties and contacts, intimacy, privacy in communication, the ability to unity, alienation from oneself, self-dissolution, which is confirmed by the results of the study of Artemtseva N.Г. (2019). Regarding behavior within professional activities, Biktagirova A. R. and Garifullina G. F. (2018) showed that the co-dependent personality is characterized by the desire to lead others and problems in the emotional sphere - the co-dependent personality is periodically in a depressed or depressed state. The authors also note that a co-dependent person has the qualities of a manipulator, is able to spiritually and emotionally infect other people and very often creates insurmountable difficulties in professional and personal development of a person. In the course of the study realized by A. A. Avanesyan, M. A. Kulachenko, A. V. Moskalenko (2020), it was found that co-dependent personalities against the background of the prevalence of a negative background of attitude to themselves have a tendency to constant control of their activities. They are characterized by high demands on themselves, which leads to a conflict between the real "I" and the "I" ideal, between the level of their claims and achievements, as well as to the recognition of their low value. Sultanova and colleagues (2022) found a negative relationship of co-dependence with such characteristics as self-esteem, success and autonomy. It is also noted that the severity of co-dependence is associated with emotional lability, low mood level and feelings of helplessness; external locus of control and sensitivity to external evaluation; as well as hypochondriasis and tendency to somatization of experiences.

In psychology and philosophy, it is believed that a person's self-relationship is based on self-awareness (Artsimovich, 2008; Stolin, 1988). Since the times of R. Descartes and J. Locke, reflexion as the ability to self-analyze and critically reflect on one's thoughts, emotions, and actions in different spheres of life has been considered the basis of self-awareness (Stolin, 1988). In essence, reflexion allows a person to form an idea of himself, his values and life priorities, to conceptualize his existence, which implies a close connection between the meaningfulness of life, reflexion and self-relationship.

This connection has been repeatedly confirmed on various samples (Andreeva, 2023; Kartasheva, 2022; Ryabysheva, 2014). It can also be noted that reflexion itself is heterogeneous and is not an unambiguously constructive property (Leontiev & Osin, 2014). Given the differences in the forms of reflexion itself, it can be assumed that the nature of its connection with self-relationship can also be ambiguous.

In psychogenetics, most current work agrees that self-esteem, like other enduring personality characteristics, is genetically determined (Jonassaint et al., 2012; Kilford et al., 2015; Neiss, Sedikides & Stevenson, 2002; Shikishima et al., 2018). For example, genetic factors may play a key role in shaping the affective and cognitive aspects of personal self-esteem, in particular, they may influence individual differences in processing information related to the evaluation of the self and one's abilities (Podina et al., 2015). It has also been shown that genes for neurotransmitter systems can influence the level of sensitivity to stress in general, as well as to criticism, success or failure, which influences self-esteem formation (Niitsu et al., 2022; Serrano et al., 2021; Richter, 2017). Studies on samples of adolescents suggest that COMT and DRD2 gene polymorphisms are associated with levels of victimization and overall levels of dysregulation (Jonassaint et al., 2012; Gao et al., 2022). Comparative studies on model organisms have also repeatedly shown that the DRD2 gene encoding the dopamine D2 receptor (D2R) may be associated with decreased socialization motivation and symptoms of some neuropsychiatric disorders such as schizophrenia and major depression (Ike et al., 2023). In addition, there is evidence that in humans, the COMT gene modulates personal self-awareness and cognitive flexibility (Wang et al., 2016), and is also associated with the formation of dysfunctional or irrational beliefs (Schmack et al., 2015; Podina et al., 2015).

Thus, the analysis of the literature allows us to conclude that the self-relationship and of co-dependent women has its own specificity and can be one of the key targets of therapy. Self-relationship and formation is based on the ability to comprehend and evaluate one's experience, feelings, and personality as a whole, which indicates a possible connection between the self-relationship of co-dependent women and the features of reflection. There is also reason to believe that COMT and DRD2 genes may be associated with peculiarities of self-relationship. In this regard, the purpose of this study is to identify psychological and genetic predictors of the level of self-esteem of co-dependent women.

Methods

The sample consisted of 353 people - women aged 18 to 54 years (mean age 29.6 years). Of these, 188 were women aged 18 to 54 years (average age 34.3 years) who were in a relationship or related to an addict (alcoholism, drug addiction, non-chemical addictions).

The following psychological tests were used to investigate the features of self-relationship, reflection and meaningfulness of life:

- Self-relationship test-questionnaire (V. V. Stolin, S. R. Pantileev);
- Differential Type of Reflexion" questionnaire (D.A. Leontiev);
- test of meaning and life orientations (D.A. Leontiev);
- co-dependence scale (B. Winehold, J. Winehold).

The survey of respondents was conducted between 13.09.2022 and 20.03.2023 in person, in the format of electronic testing.

The method of molecular genetic analysis was used to investigate genetic predictors. As candidate genes we considered the genotypes of dopamine receptor DRD2 (rs1800497) and COMT enzyme gene (Val158Met).

The collection of genetic material from the subjects (buccal epithelium) for genomic DNA isolation took place immediately after the completion of psychological diagnosis, mostly in the morning. DNA was analyzed by allele-specific polymerase chain reaction (PCR) with "real-time" detection. 107 people participated in the study with the collection of genetic material, of whom 60 were women from 22 to 52 years old (mean age 35.3 years), who were related or in a romantic relationship with the addict (alcoholism, drug addiction, non-chemical addictions).

Methods of mathematical statistics: Shapiro-Wilk criterion was used to determine whether the empirical distribution conformed to the normal law; the nonparametric Kruskal-Wolis criterion was used to study the significance of differences in the selected subgroups (in as a posteriori analysis a pairwise comparison by Dunn's method was carried out); to build a model of predictors of self-attitudes a variance analysis with ANCOVA covariates was used, where the factors were genotypes for the genes under study, and the covariates were reflexion parameters and meaning-life orientations. Correlation analysis with Spearman's rank correlation coefficient was also applied.

Statistical processing was performed using the JASP 0.16 software package.

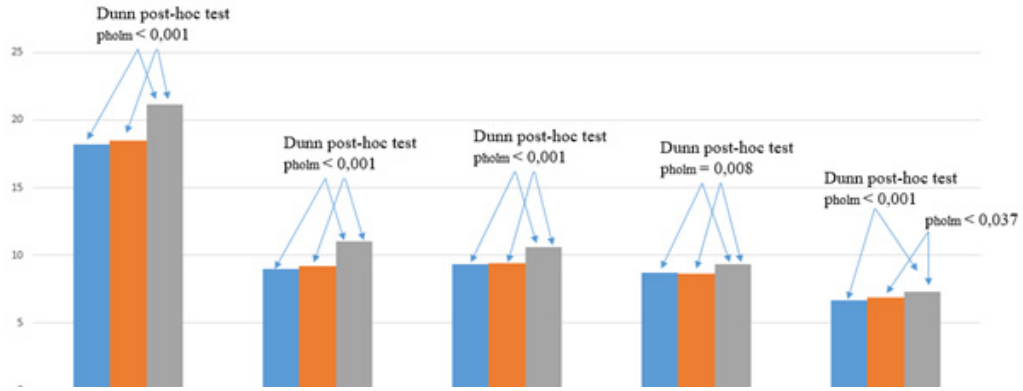
Results

As a result of the analysis of the components and the general level of self-relationship in the sample, it was possible to establish that the group of co-dependent women who are related or in a romantic relationship with an addict (alcoholism, drug addiction, non-chemical addictions) show significantly lower scores in comparison with the control group of women who did not indicate persons with addiction in their close environment and who have low and average scores on the Wineholds co-dependency scale (Figure 1). Significant differences were also found between the two subgroups of the control group (those who did not identify persons with addiction in their close environment): between the group with low and average scores and the group with

high scores on the Wineholds co-dependence scale. All the results of the calculation of descriptive statistics and normality tests are presented in Appendix 1.

Figure 1

Results of the study of self-esteem in the sample (mean values and comparative analysis)



Note: *Group 1 - Co-dependent (N= 188); Group 2 - High level of co-dependence in the control group (N= 89); Group 3 - Low and medium levels of co-dependence in the control group (N= 80)*

Next, a Spearman correlation analysis was conducted between the components and the overall level of self-esteem in the sample, types of reflection, meaning-life orientations, and overall level of meaningfulness of life (Table 1).

Table 1

Results of correlation analysis between the components and the overall level of self-attitude in the sample, types of reflection, meaning-life orientations and the overall level of meaningfulness of life (N = 353)

Variable		S scale	Self-esteem	Autosympathy	Expected attitude from others	Self-interest
Systemic reflection	Rs	0,11	0,12	-	0,148	0,226
	p-value	0,037	0,024	-	0,005	< ,001
Introspection	Rs	-0,531	-0,576	-0,294	-0,286	-0,254
	p-value	< ,001	< ,001	< ,001	< ,001	< ,001

Variable		S scale	Self-esteem	Autosympathy	Expected attitude from others	Self-interest
Quasireflexion	Rs	-0,238	-0,272	-0,178	-0,121	-
	p-value	< ,001	< ,001	< ,001	0,022	-
The meaningfulness of life	Rs	0,563	0,58	-	0,42	0,347
	p-value	< ,001	< ,001	-	< ,001	< ,001
Objectives	Rs	0,531	0,56	-	0,368	0,339
	p-value	< ,001	< ,001	-	< ,001	< ,001
process	Rs	0,536	0,522	-	0,374	0,303
	p-value	< ,001	< ,001	-	< ,001	< ,001
Result	Rs	0,528	0,504	-	0,371	0,367
	p-value	< ,001	< ,001	-	< ,001	< ,001
Locus of control-I	Rs	0,574	0,59	-	0,345	0,346
	p-value	< ,001	< ,001	-	< ,001	< ,001
Locus of control - Life	Rs	0,531	0,569	-	0,399	0,317
		< ,001	< ,001	-	< ,001	< ,001

It is shown that practically all components of self-relationship have reliable positive relations with the expression of systemic reflexion, meaning-life orientations and meaningfulness of life (table 1). The exception was the autosympathy indicator, for which significant correlations were found only with the parameters of introspection and quasireflexion. At the same time, the correlations with these types of reflexion are also negative in all other cases.

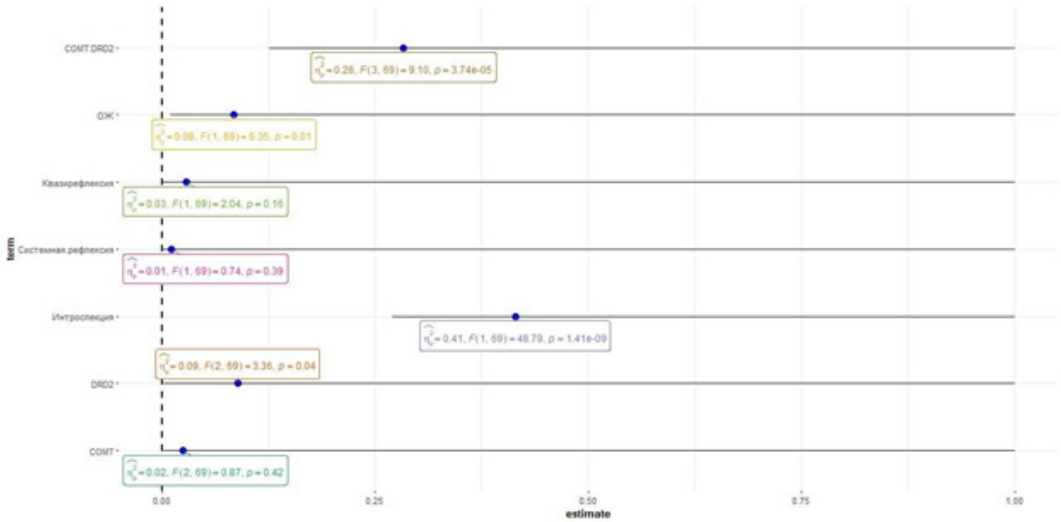
Next, an analysis of covariance was conducted to test the hypothesis that genes of the dopaminergic system, level of meaningfulness of life, and reflexivity parameters may act as predictors of co-dependent women's self-esteem (Table 2).

Table 2
Results of covariance analysis of psychological and genetic predictors of self-attitude

	Sum of squares (Sum Sq)	Mean Sq	Eta-squared (η(2))	F	p
COMT	7,19	3,60	0,02	0,87	0,422
DRD2	27,67	13,83	0,09	3,36	0,040
COMT:DRD2	112,27	37,42	0,28	9,10	<0,001
Introspection	200,71	200,71	0,41	48,79	<0,001
Systemic	3,03	3,03	0,01	0,74	0,394
Quasireflexion	8,38	8,38	0,03	2,04	0,158
The meaningfulness of life	26,13	26,13	0,08	6,35	0,014
Residuals	69 283,83	4,11			

As a result of covariance analysis it is shown that the level of meaningfulness of life, level of introspection and genotype on DRD2 gene and COMT:DRD2 gene interaction have a significant effect. Graphically described effects are presented in Figure 2.

Figure 2
Results of covariance analysis of psychological and genetic predictors of self-attitude

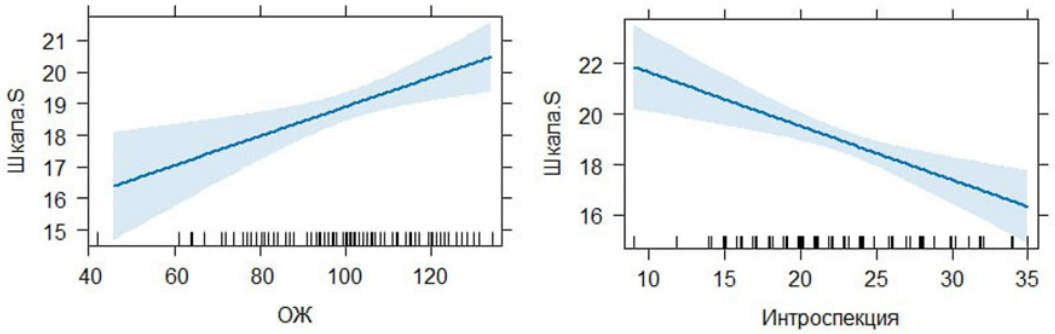


The strongest effects ($\eta^{(2)} > 0.14$) were observed between self-esteem and the level of introspection, as well as between self-esteem and the COMT:DRD2 gene interaction (Figure 2). Separately, medium effects ($\eta^{(2)} > 0.06$) were observed for the DRD2 gene and the meaningfulness of life indicator.

The data of covariance analysis are generally consistent with the data of correlation analysis and indicate that the higher the level of life meaningfulness, the higher the level of self-attitude (Fig. 3). The opposite direction is noted for introspection.

Figure 3

Analysis of relationships between the dependent variable (integral indicator of self-esteem - S Scale) and psychological predictors (meaningfulness of life - LS; introspection)



The highest values of self-esteem were observed in carriers of the CC genotype of the DRD2 gene (Fig. 4). At the same time, carriers of TT genotype have the greatest variation of values. When analyzing the joint influence, it is shown that carriers of the CC genotype of the DRD2 gene with the VV genotype of the COMT gene will have the highest values in the sample, and carriers of the CT genotype of the DRD2 gene with the VV genotype of the COMT gene will have the lowest values (Fig. 5).

Figure 4

Analysis of the level of self-esteem of co-dependent women carriers of different genotypes for the DRD2 gene

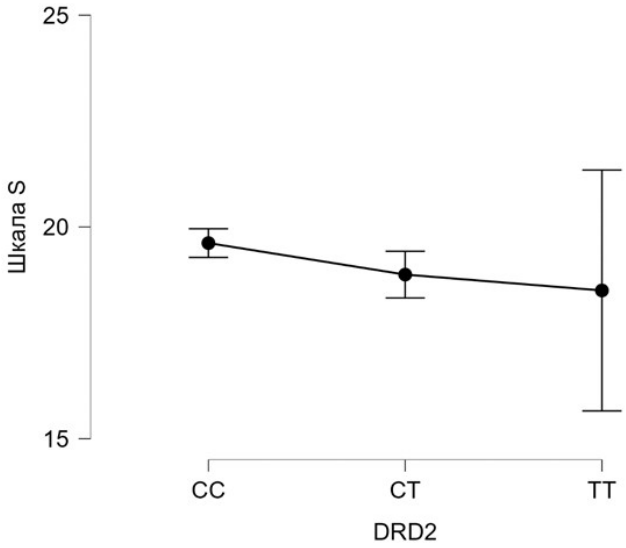
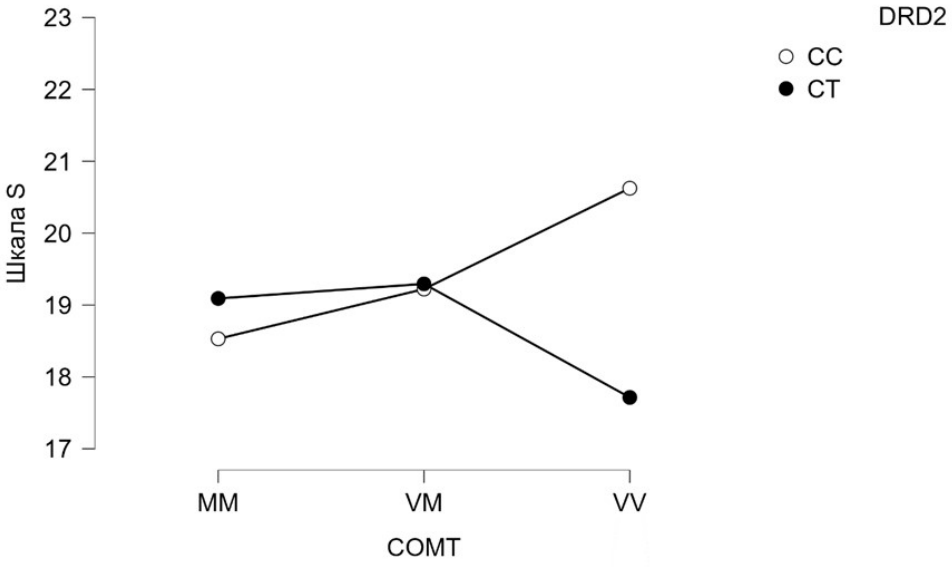


Figure 5

Analysis of the level of self-esteem of co-dependent women carriers of different genotypes for DRD2 and COMT genes



Discussion

The conducted research has shown that the level of self-esteem significantly differs in carriers of different genotypes of DRD2 and COMT genes, has positive correlation with the level of life meaningfulness and negative correlation with introspection. The results of correlation analysis generally correspond to the conclusions based on the theoretical analysis of scientific literature and the data of empirical studies obtained on different samples (Andreeva, 2023; Kartasheva, 2022; Ryabysheva, 2014). Most modern sources also support the idea that genes of the dopaminergic system can be associated with various personality characteristics and cognitive functions. Carriers of the CC genotype of the DRD2 gene at the rs1800497 locus may have more pronounced dopamine receptor activity, which is associated in the literature with increased information processing speed and behavioral reactivity, and reduced (compared to carriers of the T allele) severity of anxiety and depression symptoms (Mosset et al., 2022; Li, Bäckman, Persson, 2019). Variants at the Val158Met polymorphic locus of the COMT gene, also known as "Warrior or Worrier" (Serrano et al., 2021; Gafarov et al., 2021), have been directly linked to the activity of the enzyme catechol-O-methyltransferase, responsible for the metabolism of catecholamines, including dopamine. VV genotype carriers have lower dopamine levels due to higher COMT enzyme activity, according to some authors, this makes them more stress-resistant, more attentive, more effective in situations of uncertainty (Serrano et al, 2021); VM carriers have an intermediate variant in enzyme activity, and may show greater diversity in behavior regulation (Mueller et al., 2014; Cha et al., 2022; Gafarov et al., 2021); MM genotype carriers are characterized by greater emotionality, impulsivity, instability, and increased risk of developing mental illnesses (Gafarov et al., 2021). Thus, the highest level of self-esteem in carriers of the CC genotype of the DRD2 gene and the heterozygous VV genotype of the COMT gene may be due to a balance between a higher level of dopaminergic activity, characteristic of the CC DRD2 genotype, and high COMT activity, contributing to an optimal level of dopamine metabolism. In turn, a reduced amount of receptor density (CT genotype of the DRD2 gene) in conjunction with a highly active COMT variant will yield the most significant reduction in dopaminergic transmission and the lowest self-esteem scores in a sample of co-dependent women. However, it should be noted that the genetic basis of self-esteem is extremely complex and multifaceted, and specific genes may only play a role in the context of other genetic and environmental factors. Further research in this area will help expand our understanding of the genetic mechanisms underlying self-esteem.

Conclusions

The study aimed to identify psychological and genetic predictors of the level of self-esteem of co-dependent women. The genes of the dopaminergic system were selected as candidate genes, namely the dopamine receptor gene of the second type DRD2 (polymorphic locus rs1800497) and the COMT enzyme gene (polymorphic

locus Val158Met). The obtained data allow us to conclude that the level of self-esteem significantly differs in carriers of different genotypes of DRD2 and COMT genes. At the same time, the highest level of self-esteem was observed in carriers of genotype CC of DRD2 gene and variant VV of COMT gene. The positive effect on the level of self-esteem has an increase in the level of life meaningfulness and a decrease in the tendency to unproductive "self-digging" (introspection).

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Appendix

Descriptive statistics on the sample: a study of self-esteem

		Mean	Standard deviation (Std, Deviation)	Shapiro-Wilk test (Shapiro-Wilk test)	P-value of Shapiro-Wilk
S scale	Group 1	18,234	4,216	0,922	< ,001
	Group 2	18,449	4,017	0,936	< ,001
	Group 3	21,163	3,042	0,903	< ,001
Self-esteem	Group 1	8,995	2,861	0,960	< ,001
	Group 2	9,191	2,540	0,970	0,036
	Group 3	11,000	2,250	0,945	0,002
Autosympathy	Group 1	9,378	2,349	0,939	< ,001
	Group 2	9,449	2,620	0,968	0,026
	Group 3	10,625	1,912	0,939	< ,001
Expected attitude from others	Group 1	8,707	1,750	0,872	< ,001
	Group 2	8,674	1,664	0,917	< ,001
	Group 3	9,325	1,167	0,812	< ,001
Self-interest	Group 1	6,702	1,450	0,792	< ,001
	Group 2	6,865	1,391	0,772	< ,001
	Group 3	7,313	0,976	0,709	< ,001
self-confidence	Group 1	5,005	1,620	0,922	< ,001
	Group 2	4,899	1,438	0,947	0,001
	Group 3	5,813	1,159	0,857	< ,001
attitude of others	Group 1	5,734	1,036	0,757	< ,001
	Group 2	5,708	1,014	0,859	< ,001
	Group 3	5,825	0,569	0,648	< ,001
self-acceptance	Group 1	5,165	1,548	0,892	< ,001
	Group 2	5,045	1,445	0,892	< ,001
	Group 3	5,525	1,125	0,854	< ,001
self-management	Group 1	4,101	1,294	0,942	< ,001
	Group 2	4,382	1,257	0,935	< ,001
	Group 3	4,775	1,158	0,865	< ,001

		Mean	Standard deviation (Std, Deviation)	Shapiro-Wilk test (Shapiro-Wilk test)	P-value of Shapiro-Wilk
self-incrimination	Group 1	4,282	1,758	0,941	< ,001
	Group 2	4,079	1,835	0,952	0,002
	Group 3	3,587	1,733	0,932	< ,001
self-interest	Group 1	6,016	1,322	0,731	< ,001
	Group 2	5,989	1,394	0,727	< ,001
	Group 3	6,575	1,167	0,422	< ,001
self-understanding	Group 1	3,755	1,442	0,937	< ,001
	Group 2	3,888	1,563	0,944	< ,001
	Group 3	4,800	1,184	0,899	< ,001
Systemic reflection	Group 1	40,537	4,842	0,943	< ,001
	Group 2	39,674	4,835	0,966	0,019
	Group 3	38,8	5,522	0,966	0,03
Introspection	Group 1	23,569	5,766	0,983	0,024
	Group 2	24,775	4,97	0,965	0,016
	Group 3	19,313	5,046	0,978	0,173
Quasireflexion	Group 1	24,261	5,287	0,989	0,158
	Group 2	25,966	5,426	0,978	0,129
	Group 3	22,063	5,782	0,986	0,54
OW	Group 1	97,632	19,797	0,97	0,042
	Group 2	92,033	18,654	0,983	0,888
	Group 3	105,318	17,442	0,956	0,417
Objectives	Group 1	30,598	8,085	0,95	0,002
	Group 2	30,067	7,538	0,932	0,057
	Group 3	34,136	5,54	0,951	0,334
process	Group 1	27,368	5,889	0,976	0,102
	Group 2	25,7	5,621	0,953	0,208
	Group 3	29,682	4,989	0,934	0,15

		Mean	Standard deviation (Std, Deviation)	Shapiro-Wilk test (Shapiro-Wilk test)	P-value of Shapiro-Wilk
Result	Group 1	25,46	6,088	0,965	0,017
	Group 2	23,433	6,118	0,966	0,428
	Group 3	27,773	6,102	0,893	0,022
LK-YA	Group 1	20,023	5,272	0,958	0,006
	Group 2	18,367	4,824	0,948	0,147
	Group 3	21,773	3,816	0,958	0,455
LC-L	Group 1	29,276	7,337	0,974	0,079
	Group 2	27,933	6,313	0,978	0,78
	Group 3	31,545	6,537	0,969	0,696
The co-dependency scale (B, Winehold, J, Winehold),	Group 1	41,809	8,419	0,988	0,127
	Group 2	46,382	5,793	0,894	< ,001
		33,15	4,551	0,931	< ,001

Legend: *Group 1 - Co-dependent (N= 188); Group 2 - High level of co-dependence in the control group (N= 89); Group 3 - Low and medium levels of co-dependence in the control group (N= 80)*

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Conflict of Interest Information

The authors have no conflicts of interest to declare.