

Temperamental properties and personality organisation in individuals with alcohol dependence

Właściwości temperamentu a organizacja osobowości osób uzależnionych od alkoholu

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Abstract

Introduction and aim: The clinical approach to the diagnosis of mental disorders focuses on identifying mechanisms that predispose to pathology. Temperament, which is determined by biological factors, mediates, among others, the need for stimulation, which may manifest in risky behaviours, including problematic alcohol use. The aim of the study was to verify the relationships between temperamental properties and dimensions of personality organisation in alcohol-dependent individuals. **Materials and methods:** The study involved 91 alcohol-dependent individuals (26 women and 65 men). We used the PTS Temperament Questionnaire to measure the strength of excitation, the strength of inhibition and the mobility of nervous processes; the Inventory of Personality Organization (IPO) to assess the dimensions of personality organisation: primitive defences, identity diffusion, reality testing, aggression and moral values; as well as a demographic questionnaire. **Results:** Significant relationships were found between the strength of inhibition and mobility of nervous processes with all dimensions of personality organisation: primitive defences, identity diffusion and the ability to test reality, as well as aggression and moral values. The strongest relationship was demonstrated between the strength of inhibition and aggression. A weak, negative correlation was also noted between the strength of excitation and identity diffusion. Exploratory analyses further showed that the stronger the temperament type (higher strength of excitation and inhibition), the smaller the impairment of personality organisation in the group of alcohol-dependent individuals. The most severe disorders of personality organisation were shown by alcohol-dependent individuals with a weak temperament. **Conclusions:** Both correlational and exploratory analyses have shown that biologically determined temperamental traits are related to the abnormally developed personality organisation in alcohol-dependent individuals.

Keywords: temperament, personality organisation, alcohol dependence

Streszczenie

Wprowadzenie i cel: Podejście kliniczne w zakresie diagnozy zaburzeń psychicznych koncentruje się na identyfikacji mechanizmów predysponujących do rozwoju patologii. Temperament, cechujący się uwarunkowaniem biologicznym, reguluje m.in. potrzebę stymulacji, która może się przejawiać zachowaniami ryzykownymi, w tym problematycznym używaniem alkoholu. Celem pracy była weryfikacja związków pomiędzy właściwościami temperamentu a wymiarami organizacji osobowości u osób uzależnionych od alkoholu. **Materiał i metody:** W badaniu wzięło udział 91 osób uzależnionych od alkoholu (26 kobiet i 65 mężczyzn). Zastosowano Kwestionariusz Temperamentu PTS, mierzący siłę procesu pobudzenia, siłę procesu hamowania i ruchliwość procesów nerwowych, Inwentarz Organizacji Osobowości (Inventory of Personality Organization, IPO), badający wymiary organizacji osobowości: mechanizmy obronne, integrację tożsamości i zdolność testowania rzeczywistości, a także natężenie agresji i wartości moralne, oraz metryczkę. **Wyniki:** Zaobserwowano istotne związki siły procesu hamowania i ruchliwości procesów nerwowych ze wszystkimi wymiarami organizacji osobowości: stosowanymi mechanizmami obronnymi, stopniem integracji tożsamości i zdolnością do testowania rzeczywistości, a także z natężeniem agresji i wartościami moralnymi. Najsilniejszy związek wykazano pomiędzy siłą procesu hamowania a skalą natężenia agresji. Słabą, ujemną korelację odnotowano także pomiędzy siłą procesu pobudzenia a integracją tożsamości. Analizy eksploracyjne wykazały też, że im silniejszy typ temperamentu (wyższe siła procesu

pobudzenia oraz siła procesu hamowania), tym mniejsze nieprawidłowości w organizacji osobowości w grupie osób uzależnionych od alkoholu. Najwyższe nieprawidłowości w zakresie organizacji osobowości ujawniają osoby uzależnione od alkoholu o słabym typie temperamentu. **Wnioski:** Zarówno analizy korelacyjne, jak i eksploracyjne pokazują, że biologicznie uwarunkowane cechy temperamentu ujawniają związek z nieprawidłowo rozwiniętą organizacją osobowości osób uzależnionych od alkoholu.

Słowa kluczowe: temperament, organizacja osobowości, uzależnienie od alkoholu

INTRODUCTION

Alcohol addiction and excessive alcohol consumption in the form of hazardous and harmful drinking give rise to multiple negative consequences at both individual and social level (Włodarczyk, 2018). Alcohol is consumed for various reasons, such as cultural background, stress reduction and mood improvement (Bryl et al., 2020). Biologically determined and relatively stable temperamental characteristics play an important role in people's involvement in alcohol consumption (Erzin et al., 2020; Vecchiotti et al., 2023; Vikas et al., 2018). Since temperament is distal in nature, it may constitute the basis for the development of alcohol problems when interacting with other individual and environmental factors (Poprawa, 2013). Research investigating the relationship between temperament and alcohol use has been so far based mainly on Strelau's regulatory theory of temperament and Cloninger's psychobiological model of temperament (Cloninger et al., 2002; Miklewska and Miklewska, 2000; Oniszczenko et al., 2014). The present study used Pavlov's theory, which says that the properties of the nervous system underlie individual differences related to behaviour regulation (Strelau, 2012).

Ivan Pavlov introduced the concept of nervous system as a configuration of basic properties: the strength of

excitation and inhibition, and the mobility of nervous processes (Strelau, 1985). The strength of excitation is responsible for, among other things, the functional capacity of the nervous system during strong and extended excitation. In turn, the strength of inhibition, considered a dimension of self-control, includes, among others, the ability to cease, postpone and interrupt activities as needed. The mobility of nervous processes is the ability to appropriately respond to rapidly changing stimuli, adequately to changes occurring in the surroundings (Strelau and Zawadzki, 1998).

Otto F. Kernberg considers temperament as the fundamental constitutive structure of personality, represented by psychomotor, cognitive, and affective reactivity (Kernberg, 1992, 2016). Kernberg's model is primarily based on the theory of object relations and takes into account the role of neurobiological and environmental factors in shaping personality organisation (Cierpiąłkowska and Marszał, 2013). The author searches for the sources of pathomechanisms leading to mental disorders, using the dimensions of personality structure (Wojtynkiewicz et al., 2020). The most important ones include identity, object relationship, primitive defences, reality testing and moral values (Kosowska and Wojtynkiewicz, 2021).

It is pointed out that personality organisation in alcohol-dependent individuals is more pathological than that of

Variable	Females (n = 26, 29%)	Males (n = 65, 71%)	Total N = 91
	M (SD)	M (SD)	M (SD)
Age [years]	44 (13.4)	43 (12.8)	43.5 (12.9)
Age at alcohol initiation [years]	17 (2.5)	17 (4.2)	17 (3.8)
Age at problematic use initiation [years]	32 (11.6)	28 (9.5)	28 (10.4)
	n (%)	n (%)	n (%)
Place of residence: rural	2 (7.7)	9 (13.8)	11 (12)
Place of residence urban	24 (92.3)	56 (86.2)	80 (88)
Marital status: single	12 (49)	34 (52)	46 (51)
Marital status: relationship	14 (51)	31 (48)	45 (49)
Education: primary	1 (3.9)	4 (6.1)	5 (6)
Education: middle school	1 (3.9)	4 (6.1)	5 (6)
Education: vocational	2 (7.7)	14 (21.6)	16 (18)
Education: secondary	10 (38.4)	26 (40)	36 (40)
Education: higher	12 (46.1)	17 (26.2)	29 (32)
Somatic comorbidities	3 (3)	13 (14)	16 (17)
Mental comorbidities	26 (100%)	65 (100)	91 (100)

M – mean, *SD* – standard deviation.

246 Tab. 1. Descriptive statistics of the study group

Temperamental trait	Strength of excitement	Strength of inhibition	Mobility of nervous processes
Primitive defences	-0.20	-0.36***	-0.30**
Identity diffusion	-0.27**	-0.41***	-0.33***
Reality testing	-0.13	-0.25*	-0.26*
Aggression	-0.03	-0.58***	-0.26*
Moral values	-0.04	-0.33**	-0.27**

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Tab. 2. Spearman's rho correlation analysis of the relationship between temperamental traits and personality organisation

non-addicted people (Wojtynkiewicz et al., 2020). So far, empirical research has not addressed the issue of verifying the relationship between personality organisation and temperament. It seems justified to investigate such a relationship, especially from a practical point of view, in the context of individualisation of therapy or other forms of help, as well as predicting relapses during abstinence.

The aim of the study was to verify the relationship between temperament and personality organisation in alcohol-dependent individuals. It was hypothesised (H1) that temperamental properties are negatively correlated with the dimensions of personality organisation. Data exploration also gave rise to a hypothesis (H2) on the possibility of distinguishing subgroups characterised by certain patterns in terms of temperament and personality organisation.

MATERIALS AND METHODS

The research was conducted from June 2022 to February 2023 in the self-help groups of Alcoholics Anonymous (AA), addiction therapy clinics, a day addiction therapy unit and a warming centre for the homeless located in

Bydgoszcz, Płock and Poznań, after obtaining approval from facility managers and AA group leaders. Respondents gave voluntary, written consent to participate in the study. They were also informed on the research purpose and anonymity, as well as assured of the possibility of withdrawing at any time; they did not depend on the researcher.

The study involved 91 alcohol-dependent individuals, including 26 women and 65 men. The age of participants ranged from 20 to 77 years (mean, $M = 43.5$; standard deviation, $SD = 12.9$). The age of alcohol initiation was on average 17 years, and the age at which problematic alcohol use began was 28 years. Tab. 1 presents descriptive statistics of the study group.

Research tools

The PTS Temperament Questionnaire by Jan Strelau and Bogdan Zawadzki was used to assess temperamental traits (Strelau and Zawadzki, 1998). It consists of 57 items rated on a four-point Likert scale (1 – strongly agree, 2 – rather agree, 3 – rather disagree, 4 – strongly disagree). The tool is based on the Pavlov's theory, according to which all human behaviours are controlled and regulated by the central

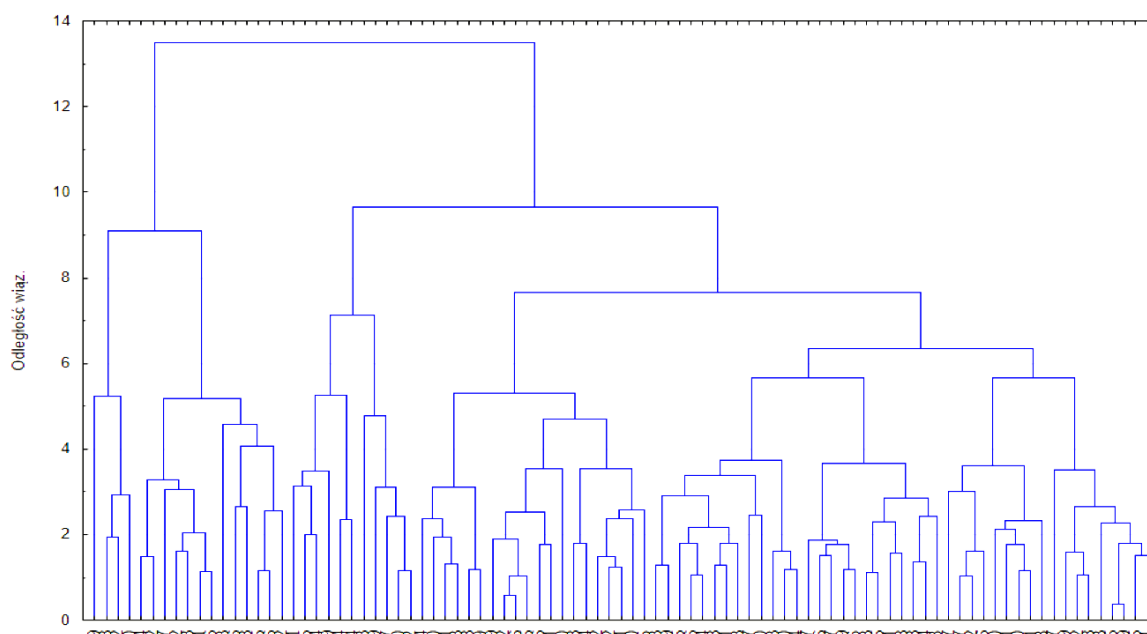


Fig. 1. Cluster analysis: temperament and personality organisation in study participants using the agglomerative clustering with Euclidean distance

Clusters	1	2	3	4
1	–	1.84	0.90	1.30
2	1.84	–	1.71	3.05
3	0.90	1.71	–	1.51
4	1.30	3.05	1.51	–

Tab. 3. Euclidean distances of clusters

Cluster	Cluster 1 n = 32 (35%)	Cluster 2 n = 14 (15.4%)	Cluster 3 n = 28 (31%)	Cluster 4 n = 17 (18.6%)	F (3.87)	p	HSD
	M (SD)	M (SD)	M (SD)	M (SD)			
Strength of excitement	5.75 (0.98)	8.07 (1.07)	4.29 (1.12)	3.06 (1.14)	65.89	<0.001	1, 2, 3 > 4; 2, 3 > 4; 3 > 4
Strength of inhibition	4.19 (1.09)	7.57 (1.22)	6.04 (1.10)	3.12 (1.05)	55.12	<0.001	1, 2, 3 > 4; 2, 3 > 4; 3 > 4
Mobility of nervous processes	4.78 (0.94)	7.64 (1.28)	5.11 (1.34)	2.59 (1.28)	46.46	<0.001	1, 2 > 4; 2, 3 > 4; 3 > 4
Primitive defences	2.91 (0.62)	2.25 (0.64)	2.55 (0.61)	3.11 (0.53)	6.79	<0.001	1 > 2; 2 < 4; 3 < 4
Identity diffusion	2.91 (0.72)	2.16 (0.67)	2.41 (0.57)	3.39 (0.74)	11.71	<0.001	1, 2 > 3; 2 < 4; 3 < 4
Reality testing	2.28 (0.73)	1.71 (0.81)	1.95 (0.71)	2.29 (0.78)	2.64	0.055	Insignificant
Aggression	2.20 (0.59)	1.42 (0.37)	1.68 (0.52)	2.25 (0.74)	9.69	<0.001	1, 2 > 3; 2 < 4; 3 < 4
Moral values	2.62 (0.57)	2.11 (0.42)	2.38 (0.71)	2.87 (0.60)	4.87	<0.001	2 < 4

F – analysis of variance test value; M – mean; p – level of significance of differences; HSD – Tukey's reasonable significant difference test; SD – standard deviation.

Tab. 4. Descriptive statistics and analysis of variance for the identified clusters

nervous system. The tool measures the strength of excitation (SE), the strength of inhibition (SI) and the mobility of neural processes (MNP). In the study, the reliability results for the subscales were: $\alpha = 0.82$ for SE; $\alpha = 0.74$ for SI; $\alpha = 0.82$ for MNP.

The Inventory of Personality Organization (IPO) adapted by Agnieszka Izdebska and Beata Pastwa-Wojciechowska (Izdebska and Pastwa-Wojciechowska, 2013) was used to assess personality organisation. It is used in the diagnosis of the level of personality organisation, in accordance with Kernberg's concept of personality organisation. The tool consists of 83 self-description items rated on a five-point Likert scale (from 1 – never to 5 – always). IPO items are divided into three main clinical scales: identity diffusion, reality testing and primitive defences, and two additional scales: aggression and moral values. The reliability of the individual scales was as follows: $\alpha = 0.92$ for identity diffusion; $\alpha = 0.93$ for reality testing; $\alpha = 0.86$ for primitive defences; $\alpha = 0.87$ for aggression; $\alpha = 0.76$ for moral values.

Statistica 13.3 was used for statistical calculations. The following statistical procedures were used: Cronbach's α value to estimate the reliability of the tools used, Spearman's rho correlations to assess relationships between variables, cluster analysis with analysis of variance and Tukey's reasonable significant difference (RSD) test to isolate study groups.

RESULTS

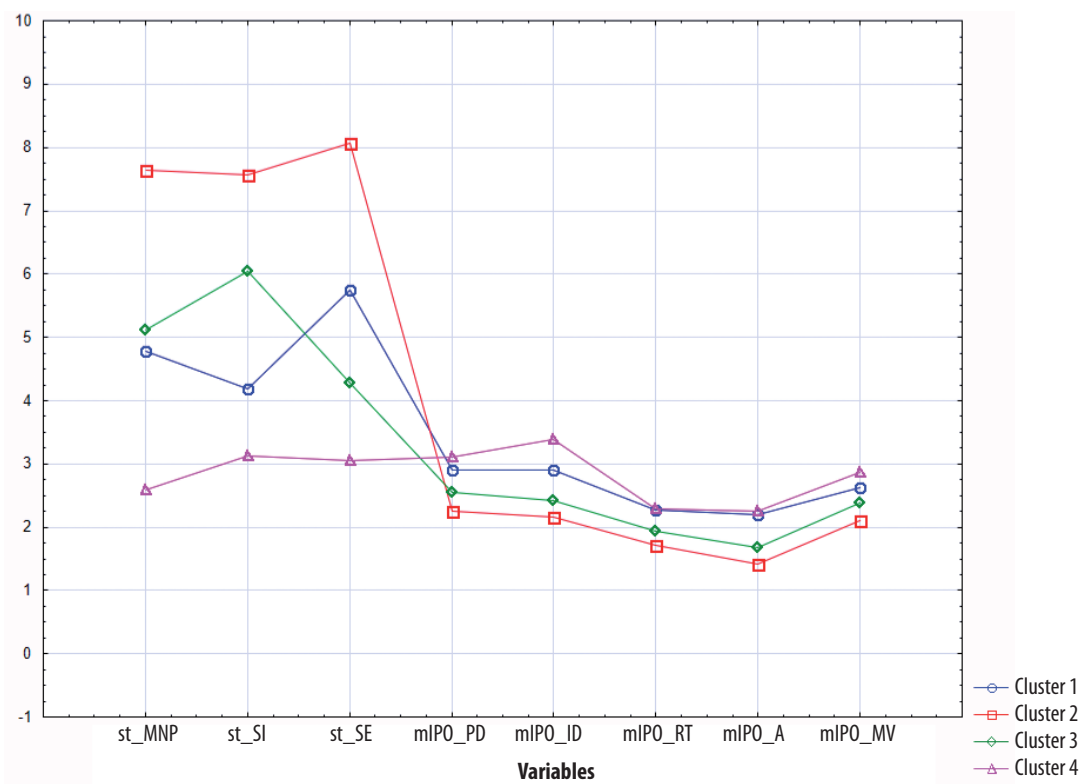
In accordance with our assumption (H1), temperamental traits were negatively correlated with all dimensions of personality organisation. The strength of excitation showed a statistically significant relationship only with identity diffusion. The strength of inhibition showed statistically significant relationships with all dimensions of personality

organisation, with the strongest correlation with aggression and the weakest correlation with reality testing. The mobility of neural processes was also found to be significantly correlated with all dimensions of personality organisation, with the strongest correlation with identity diffusion. Tab. 2 shows the relationships of the tested variables.

The assumption (H2) on the existence of clusters differing in terms of temperamental properties and personality organisation was confirmed. In the first stage of exploratory analyses, the agglomeration method was used using Euclidean distance, which showed strong correlations between variables. A decision was made to adopt a solution assuming the existence of four clusters showing significant differences between one another, but at the same time the smallest possible differentiation within themselves. The obtained results are shown in Fig. 1.

In the next step of the analysis, respondents were grouped into separate clusters using *k*-means clustering. The Euclidean distances of the clusters are presented in Tab. 3. Tab. 4 contains descriptive statistics and the results of the analysis of variance for the identified clusters, which are shown in Fig. 2. The analysis of variance showed that the reality testing variable is the only one that does not differentiate the groups. The mean value chart shows that the weaker the temperament type (lower SE, SI and MNP), the more severe the personality pathology, i.e. greater identity diffusion, less mature defence mechanisms, less integrated moral functioning and higher aggression.

Cluster 1. Individuals belonging to this cluster are characterised by reduced strength of inhibition in relation to the strength of excitation, which indicates a moderately strong temperament type, with moderate mobility of nervous processes, relatively balanced, but characterised by a poorer ability to inhibit affective reactions and impulses.



st_MNP – mobility of nervous processes; **st_SI** – strength of inhibition; **st_SE** – strength of excitation; **st** – results converted into sten scores according to standards; **IPO** – Inventory of Personality Organization; **mIPO_PD** – IPO – primitive defences; **mIPO_ID** – IPO – identity diffusion; **mIPO_RT** – IPO – reality testing; **mIPO_A** – IPO – aggression; **mIPO_MV** – IPO – moral values; **m** – mean.

Fig. 2. Mean cluster plot of personality organisation dimensions and temperamental traits

The severity of personality pathology in this group is similar to that for cluster 4 in terms of reality testing and aggression, and slightly lower than for cluster 4, but higher than for clusters 2 and 3 in terms of identity diffusion, primitive defences and moral values.

Cluster 2. Individuals belonging to this cluster are characterised by high scores for all temperamental traits, which corresponds to a strong, balanced and mobile temperament type. This group shows the lowest severity of personality pathology.

Cluster 3. This cluster is formed by individuals whose temperamental features are at an average level, with a predominance of the strength of inhibition, which indicates a temperament that is moderately strong, quite balanced, but with a greater ability to inhibit reactions. The severity of personality pathology in this group is slightly higher than in cluster 2, but lower than in clusters 1 and 4.

Cluster 4. Individuals belonging to this cluster have the lowest scores on all temperament traits, which indicates a weak, slower type of temperament, characterised by a low ability to inhibit affective reactions and impulses. The severity of personality pathology is the highest in this group.

DISCUSSION

The aim of the research presented in this paper was to determine the relationships between temperamental traits

derived from Pavlov's concept and personality organisation within the framework of Kernberg's theory in alcohol-dependent individuals. Previous empirical reports suggest a higher overall pathology of personality organisation in individuals addicted to alcohol and drugs compared to those non-addicted (Hiebler-Ragger et al., 2016; Wojtynkiewicz et al., 2020), which was the starting point of the research. There is also evidence that temperament plays an important role in the tendency to use alcohol (Miklewska and Miklewska, 2000; Senejko and Lachowicz-Tabaczek, 2003). Research has shown that a stronger type of temperament is associated with a lower severity of personality pathology in addicts. The strength of excitation, which determines the resistance and the ability of nerve cells to work, is mainly responsible for endurance at the time of external or internal stimulation. According to Pavlov's concept, the lower the strength of excitation, the more inadequate the reactions manifesting in various types of disorders, especially those of an emotional nature (Strelau and Zawadzki, 1998). The results indicate that it is statistically significantly correlated with identity diffusion, which indicates complex, stable, deep, realistic, but also flexible experiencing of oneself and others. Identity allows for defining healthy boundaries between an individual and the environment, as well as accurately perceiving the behaviour and emotional states of other people (Caligor and Clarkin, 2013).

The obtained results indicate that the higher strength of the excitation process in alcohol-dependent persons, which allows for a more adequate emotional response, is associated with a more consolidated and better organised identity. The strength of inhibition, considered to be related to behavioural control, showed significant correlations with all dimensions of personality organisation. It is most closely related to the control of aggression, which indicates that the tendency to aggression is caused by difficulty in refraining from emotional behaviour and reactions. The results also indicate that a higher overall severity of personality pathology is associated with lower mobility of neural processes, i.e. adequate response to environmental changes and adaptation of one's behaviour to these changes.

So far, the relationship between temperament and personality organisation has not been investigated within the concepts used, hence the results obtained relate mainly to theoretical assumptions. The results indicate that groups differing in temperament and personality organisation can be distinguished among alcohol-dependent individuals. Strong temperament, characterised by high endurance and behavioural control, is characteristic of individuals with the least severe personality pathology. It can be assumed that these individuals are able to maintain abstinence and continue addiction therapy for the longest time, who may have developed addiction as a means to regulate emotions in response to difficult life events. Those with the poorest temperamental characteristics, indicating a weak nervous system, show the highest severity of personality pathology. They are characterised by, among others: using the least mature defence mechanisms, which, according to Mellibruda's (1997) concept, indicates that these individuals may find it most difficult to maintain sobriety. It can be assumed that the configuration of high strength of excitation, high strength of inhibition and high mobility of nervous processes, as well as dimensions of the personality structure closer to the normative level will promote both persistence in the therapeutic process and maintaining abstinence. It is also puzzling to what extent addiction in this group of individuals is related to the co-occurrence of personality disorders, which are common among people with poor personality organisation (Caligor and Clarkin, 2013), as well as among addicts (Casadio et al., 2016; Zikos et al., 2010).

Kernberg pointed out that pathological personality organisation may be caused by biological and/or environmental factors that inhibit the development of a person's mental structure (see Cierpiałkowska and Soroko, 2014). The results obtained seem to confirm this. Inhibited development of the mental structure may result in rigid personality traits and repetitive behavioural patterns, and as indicated in the literature, risk factors for alcohol addiction include, among others, fixed alcohol consumption patterns (Frąckowiak and Motyka, 2015). It seems that individuals with a weaker nervous system may be more prone to rigid behavioural patterns and addictions.

PRACTICAL IMPLICATIONS

In addition to the diagnosis and therapy of addiction, the parallel diagnosis of temperamental resources and the maturity of personality organisation should be an important aspect in the treatment of alcohol-dependent individuals to allow for the selection of appropriate therapeutic interventions. Knowledge of psychodynamic aspects of personality and temperament type may be important in designing more individualised forms of treatment and predicting prognosis related to various forms of therapy. As Caligor et al. (2007) point out, patients with a better organised personality achieve better therapeutic results in insight-based therapies. Patients with a more poorly organised personality have better prognosis in supportive and psychoeducational therapies, which help to consolidate the disintegrated identity in order to activate reflexivity, which supports the healing process (Gabbard and Wilkinson, 2012).

LIMITATIONS

A significant limitation of the research is the deliberate selection of the study group, which excludes the possibility of generalising the conclusions to all alcohol-dependent individuals. The correlational nature of the research does not allow drawing conclusions on cause-and-effect relationships, but only allows indicating significant relationships between the assessed variables. The results indicate a relationship between temperamental traits and personality pathology in addicted people, but they cannot be used to conclude whether addiction intensifies personality pathology or whether more severe personality pathology may lead to addiction. Further longitudinal research should be conducted, as well as research on, e.g., the role of alcohol in individuals with different personality organisation and temperament to answer this question.

CONCLUSIONS

Temperamental traits are correlated with normative or pathological personality organisation in alcohol-dependent individuals.

Conflict of interest

The authors report no financial or personal relationships with other individuals or organisations that could adversely affect the content of the publication and claim ownership of this publication.

Author contributions

Original concept of study: AC. Collection, recording and/or compilation of data: AC. Analysis and interpretation of data: PB. Writing of manuscript: PB. Critical review of manuscript: PB. Final approval of manuscript: PB.

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