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Temperament traits based on TEMPS-A scale and the use of CBD and other psychoactive substances and drugs – original study

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Summary

Objective. To determine the relationship between the use of CBD, other psychoactive substances and medications, and temperament traits according to the TEMPS-A scale.

Material and methods. A total of 173 individuals completed an online survey that included the TEMPS-A questionnaire and questions regarding socio-demographic characteristics, CBD use, other psychoactive substances, and medications. Statistical analysis was performed using Statistica 13. The Shapiro-Wilk test, Mann-Whitney U test, Kruskal-Wallis ANOVA, Chi2 test, and regression analysis were applied.

Results. No significant differences in temperament traits were found between the CBD-using and non-CBD-using groups, regardless of the form in which CBD was used. The use of more than three psychoactive substances or medications was associated with greater hyperthymic and cyclothymic temperament. CBD users were more likely to smoke marijuana and cigarettes, and less likely to use non-opioid analgesics. Smoking marijuana was associated with lower levels of depressive temperament, while the use of painkillers, opioids and benzodiazepines was associated with higher levels of anxious temperament.

Conclusions. CBD users did not differ in temperament from the control group, although correlations between the severity of temperament traits and the use of other substances and medications were observed. CBD use was associated with more frequent smoking of cigarettes and marijuana, and less frequent use of painkillers.

Key words: temperament, TEMPS-A, CBD

Introduction

Temperament, as described by Buss and Plomin, can be defined as a set of inherited personality traits that manifest themselves early in life [1]. According to Strelau [2], temperament is one of the components of personality that exerts a strong influence on an individual's behavior. One example of behavior that is influenced by temperament is the use of psychoactive substances – numerous studies have described the relationship between temperament traits and a greater propensity to use them [3–6]. However, the term 'psychoactive substance' is a very broad concept that is not limited to just drugs – according to the WHO, it refers to a chemical substance or mixture of substances that affect brain function, resulting in changes in perception, mood, consciousness, cognitive processes, and behavior [7].

One of the most well-known categories of psychoactive substances are cannabinoids. This group of substances comes from the *cannabis sativa* and *cannabis indica* plants and acts on cannabinoid receptors [8]. Indian hemp is the source of around 100 types of cannabinoids, with delta-9-tetrahydrocannabinol (THC) and cannabidiol (CBD) being the most commonly known [9]. In addition to recreational use, cannabinoids have a wide range of therapeutic potential in the treatment of symptoms such as chemotherapy-induced nausea and vomiting, muscle spasticity. They are also used as adjuncts in the treatment of Parkinson's disease, multiple sclerosis, AIDS, rheumatoid arthritis, and epileptic syndrome [8, 10, 11].

Cannabidiol is a widely available substance in Poland. Through modulation of CB1, CB2, and also GPR55, TRPV, and PPARγ receptor activity, CBD exhibits neuroprotective, anticonvulsant, anxiolytic, antipsychotic, anti-inflammatory, analgesic, and anticancer effects [12]. In Poland, there is currently one registered cannabidiol preparation indicated for the treatment of seizure attacks in patients with Lennox-Gastaut syndrome, Dravet syndrome, and tuberous sclerosis in patients ≥1 year of age [13–16].

In Poland, it is also possible to legally purchase CBD-containing products as dietary supplements. Products containing CBD levels below 0.2% are allowed for sale under European Union legislation. However, purchasing dietary supplements without consulting a doctor or pharmacist, in amounts chosen by the patient, carries a risk of CBD side effects. It has been shown that CBD use may lead to drug interactions, liver function disorders, gastrointestinal motility disorders, fatigue, vomiting, and somnolence [17]. Potential contamination of supplements with other psychoactive or non-psychoactive substances is also a problematic issue [18].

Therefore, the use of CBD appears to be a health-promoting behavior that is not without risk; a thorough investigation of this risk could enable individualization of patient management when using CBD, particularly in the form of a dietary supplement. Temperament traits that have such a substantial impact on shaping one's behavior, may be potentially related to taking CBD. Such relationships are described for other psychoactive substances in numerous scientific reports, where the TCI – Temperament and Character Inventory questionnaire by Cloninger [19] is used. The polymorphism of genes encoding proteins responsible for the action of the serotonin and dopamine transporter causes differences in temperament traits, including the level of the need to

seek novelty, as well as the ability to self-direct as early as adolescence [3, 6, 20, 21]. It is noted that an increased need for novelty-seeking and reduced self-directedness predispose to psychoactive substance use and addiction [3–6].

However, there is a lack of studies describing the relationship between temperament traits and CBD intake, which, in view of the significant popularity of this substance, prompted the authors to investigate such relationships. The authors were also interested in the inclusion of temperament traits in the TEMPS scale (The Temperament Evaluation of Memphis, Pisa and San Diego Autoquestionnaire), which takes into account the so-called affective temperament traits, measuring the severity of hyperthymic, depressive, cyclothymic, irritable, and anxious temperament [22]. These traits can either represent a variant of the norm or, in the case of significant severity, directly predispose to affective disorders, anxiety disorders or harmful use of psychoactive substances [22, 23]. Therefore, due to the connection between affective temperament traits and the predisposition to the aforementioned mental disorders, it seems that if correlations were proven between CBD use and temperament traits, the use of CBD could constitute a predictive factor for the mentioned mental health risks.

Research objectives

1. To determine the association of CBD use with temperament traits.
2. To establish the relationship of differences in the way of using CBD with temperament traits.
3. To determine differences between females and males using CBD.
4. To establish relationship of CBD use with the frequency of using psychoactive substances and drugs other than CBD.
5. To determine the association of psychoactive substances and drugs other than CBD with temperament traits.

Material and methods

A total of 173 individuals who expressed their informed consent to participate in the study by completing the questionnaire, were examined. People aged 18–65 have been included in the research. Characteristics of the studied group is shown in Table 1. Conditions which had to be fulfilled to participate in the research were: Internet access, ability to use Microsoft Forms questionnaire, and answering all of the questions. People who had declared using CBD 6 months before participation were included in the CBD-using study group (a period of 6 months without using CBD was defined as abstinence, based on common practice in the field of psychiatry) [24–26]. The rest of them were included in the control group.

A cross-sectional study was conducted using a Microsoft Office Forms questionnaire shared online via social media Facebook and Instagram. The questionnaire (available in the Appendix of this study) consisted of an author's section containing questions about age (total number), gender, place of residence (rural or city with a cer-

tain population), and education (primary/vocational/secondary/higher education), and questions about CBD use (fact of use, time of use, frequency, forms, concentrations of CBD in used products). It also included questions about the frequency of use of other psychoactive substances and medications (alcohol, cigarettes, non-opioid analgesics, opioids, benzodiazepines, sleeping medications other than benzodiazepines, marijuana, amphetamines, dissociatives, antidepressants, neuroleptics, other psychoactive substances). The second part of the questionnaire was the TEMPS-A questionnaire in Polish, examining temperament traits such as depressiveness, cyclothymia, hyperthymia, irritability, and anxiety [22]. The given temperament traits are studied according to the concept of Hagop Akiskal, according to which they are manifested by the following characteristic components:

- Depressive temperament – tendencies toward rigidity of thought, self-blame, shyness; lack of assertiveness, sensitivity to criticism, difficulty in forming relationships, low energy level, perseverance, reliability.
- Hyperthymic temperament – high scale of experienced feelings, tendency to risky behavior, optimism, sociability, self-confidence, predilection for fun and wit, eloquence, mobility, resilience, tendency to direct others, creativity, lack of objectivity about one's own character.
- Cyclothymic temperament – labile mood, rapid changes in energy levels, self-esteem, volatility in the field of social relations, tendency to superficiality in thinking, strong experiencing of emotions, high creativity, ease in establishing relationships.
- Irritable temperament – strong resemblance to the cyclothymic temperament, marked by higher energy levels and lower levels of empathy, tendency to think critically, skeptically, tendency to be dissatisfied, overreact to stimuli, easily angered and prone to violence.
- Anxious temperament – tendencies to worry, ruminations; high mental and physical tension that can lead to somatic symptoms [22]

The Polish version of the TEMPS-A questionnaire was developed in the Department of Adult Psychiatry at the Poznan University of Medical Science and approved by Professor Akiskal after appropriate translations (translation + back translation). In the Polish conditions, in the validation trial, high internal consistency and comparability of results with previously validated language versions were obtained [22, 27].

Statistical analysis

Statistical calculations were made using Statistica version 13. A statistical significance level of $\alpha = 0.05$ was adopted. The Chi-square test was used to examine differences in the percentage of subjects with a given gender, place of residence, and education in the study and control groups. Normality of distribution of quantitative variables (age, TEMPS-A scores) was tested using the Shapiro-Wilk test. The Mann-

Whitney *U* test was used to test the differences in the age of the study group and the control group, the severity of individual temperament traits of the study group in the CBD users and non-users groups, to test the differences in the severity of temperament traits in the CBD users group depending on the frequency of CBD use, on the number of used CBD forms, on the type of used CBD forms, and knowledge of the concentration of CBD in the used products, to examine differences in the severity of temperament traits in the groups of users and non-users of stimulants and drugs other than CBD, and to examine whether there is a correlation between the severity of individual temperament traits and the number of used stimulants. The Kruskal-Wallis ANOVA test was used to examine differences in the severity of individual temperament traits of CBD users according to the duration of CBD use up to the time of the study and the concentration of CBD in the used products. Statistically significant results obtained by the above tests were subjected to additional analysis by ascending logistic regression in univariate and multivariate models.

Study group characteristics

The CBD-using study group and the non-CBD-using control group did not differ significantly in terms of age and place of residence of respondents, but they differed in terms of gender distribution and education, as shown in Table 1. Compared to the control group, the study group included a significantly higher percentage of men (p <0.01) and a lower percentage of people with higher education (p <0.003).

Table 1. **Characteristics of the study (CBD+) and control (CBD-) groups in terms of age, gender, place of residence, and education**

Trait (and its variants)		Study group (CBD+)	Control group (CBD-)	*p*
Age [median (IQR)]		23 (4)	24 (2)	$p = 0.35$
Gender	F	N: 34 (59.65%)	N: 97 (83.62%)	***p <0.01***
	M	N: 23 (40.35%)	N: 19 (16.38%)	
Place of residence	Rural	N: 6 (10.53%)	N: 19 (16.38%)	$p = 0.38$
	City of up to 10 thousand residents	N: 4 (7.02%)	N: 8 (6.90%)	
	City of 10-50 thousand residents	N: 8 (14.04%)	N: 7 (6.03%)	
	City of 50-100 thousand residents	N: 3 (5.26%)	N: 10 (8.62%)	
	City of 100-250 thousand residents	N: 9 (15.79%)	N: 25 (21.55%)	
	City of more than 250 thousand residents	N: 27 (47.37%)	N: 47 (40.52%)	

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Education	Primary	N: 2 (3.51%)	N: 1 (0.86%)	***p <0.003***
	Secondary	N: 33 (57.89%)	N: 61 (52.59%)	
	Vocational	N: 5 (8.77%)	N: 0 (0%)	
	Higher	N: 17 (29.82%)	N: 54 (46.55%)	

IQR – interquartile range

Temperament traits of the study group

Distribution of temperament traits of the study group specified using TEMPS-A questionnaire is presented in Table 2.

Table 2. **Distribution of temperament traits of the study group according to TEMPS-A (intensity measured in 0–1 range)**

Temperament Trait	Mean	SD	Median	IQR
Depressive	0.44	0.19	0.43	0.29
Cyclothymic	0.43	0.24	0.43	0.33
Hyperthymic	0.40	0.21	0.38	0.38
Irritable	0.29	0.18	0.29	0.29
Anxious	0.45	0.24	0.42	0.38

SD – standard deviation; IQR – interquartile range

Individual aspects of using CBD in the study group are presented in Table 3.

Table 3. **Data on use of CBD in study group**

CBD use		**Amount of people**	**Percentage of people**
Use of CBD within 6 months prior to the study	yes	57	32.95%
	no	116	67.05%
Duration of CBD use	1 month or shorter	11	19.30%
	1 month – 6 months	9	15.79%
	6 months – 12 months	12	21.05%
	1 year – 2 years	9	15.79%
	over 2 years	16	28.07%

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Frequency of CBD use	less often than once a month	27	47.37%
	1 – 3 times a month	8	14.04%
	1 – 3 times a week	6	10.53%
	more often than three times a week	10	17.54%
	more often than once a day	6	10.53%
Form of CBD use	oil	28	49.12%
	dried flower	40	70.18%
	other form	23	40.35%
Amount of used CBD forms	1 form	29	50.88%
	more than 1 form	28	49.12%
Concentration of CBD in used products	<5%	16	28.07%
	5 – 10%	13	22.81%
	>10%	9	15.79%
	unknown concentration	19	33.33%

CBD use in the last 6 months before the survey was declared by 32.95% of respondents.

Among the respondents there were people using all of the psychoactive substances and medicine listed in the questionnaire. Individuals who have used a given drug or medicine within 6 months prior to the study were considered as users. Most of the respondents used: alcohol (87.29%), non-opioid analgesics (78.03%), cigarettes (39.88%). Data on the amount of people using given drugs or medicine are contained in Table 4.

Table 4. **Substances other than CBD used by respondents**

Type of drug or medicine	**Amount of people using given drug or medicine with a certain frequency**		
	does not use	less often than once a week	once a week or more often
Alcohol	22 (12.71%)	98 (56.65%)	53 (30.64%)
Cigarettes	104 (60.12%)	23 (13.29%)	46 (26.59%)
Non-opioid analgesics	38 (21.97%)	122 (70.52%)	13 (7.51%)
Opioids	168 (97.11%)	3 (1.73%)	2 (1.16%)

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Benzodiazepines	163 (94.23%)	8 (4.62%)	2 (1.16%)
Hypnotic drugs other than benzodiazepines	155 (89.60%)	11 (6.36%)	7 (4.05%)
Marijuana	117 (67.63%)	40 (23.12%)	16 (9.24%)
Amphetamine	167 (96.53%)	5 (2.89%)	1 (0.58%)
Dissociatives	170 (98.27%)	3 (1.73%)	0 (0.00%)
Antidepressants	157 (90.75%)	1 (0.58%)	15 (8.67%)
Neuroleptics	172 (99.42%)	0 (0.00%)	1 (0.58%)
Other	165 (95.38%)	6 (3.47%)	2 (1.16%)

"does not use" refers to respondents who have never used a given substance or have not used it in the last 6 months prior to the study.

Results

CBD use and temperament

There were no statistically significant differences in the severity of individual temperament traits between the CBD-using group and the non-CBD-using group, as shown in Table 5.

Table 5. **Severity of temperament traits of the study group according to TEMPS-A in the study group – using CBD and the control group – not using CBD**

Temperament trait	Trait severity according to CBD use Median (±IQR)		*p*
	Using CBD	Not using CBD	
Depressive	0.38 (0.24)	0.48 (0.33)	0.16
Cyclothymic	0.48 (0.33)	0.38 (0.38)	0.065
Hyperthymic	0.43 (0.33)	0.38 (0.33)	0.14
Irritable	0.30 (0.24)	0.24 (0.25)	0.069
Anxious	0.42 (0.35)	0.42 (0.42)	0.76

Duration and ways of taking of CBD usage and temperament

Duration of CBD usage and temperament

There were no statistically significant differences in the severity of individual temperament traits in groups differing in the duration of CBD use, as shown in Table 6.

Table 6. **Severity of temperament traits according to TEMPS-A in subjects from the study group using CBD in the compared subgroups distinguished by the duration of CBD use**

Temperament trait Median (±IQR)	Time of CBD use until study					*p*
	<1 month	1-6 month	6-12 month	1-2 years	>2 years	
Depressive	0.62 (0.48)	0.38 (0.19)	0.36 (0.12)	0.43 (0.19)	0.33 (0.26)	0.31
Cyclothymic	0.48 (0.33)	0.71 (0.43)	0.43 (0.40)	0.33 (0.29)	0.48 (0.19)	0.25
Hyperthymic	0.29 (0.48)	0.48 (0.24)	0.38 (0.38)	0.57 (0.43)	0.45 (0.29)	0.34
Irritable	0.30 (0.28)	0.38 (0.24)	0.20 (0.38)	0.25 (0.29)	0.35 (0.19)	0.45
Anxious	0.50 (0.54)	0.50 (0.27)	0.42 (0.35)	0.38 (0.31)	0.38 (0.27)	0.39

IQR – interquartile range

Ways of taking CBD and temperament

Frequency of using CBD

The distribution of temperament traits in the groups using CBD at different frequencies is shown in Table 7. The group of CBD users using CBD more often than one time per month had a statistically significantly lower level of depressive temperament severity and a statistically significantly higher level of hyperthymia severity ($p = 0.03$; $p = 0.003$, respectively). A logistic regression test was then applied, which at the univariate analysis stage showed no significant effect of these temperament traits on the use of CBD more often than one time per month, as shown in Table 8.

Table 7. **Severity of temperament traits according to TEMPS-A in CBD users in comparison subgroups distinguished by frequency of CBD use**

Temperament trait [Median (±IQR)]	Frequency of CBD use		*p*
	Less than once a month	More than once a month	
Depressive	0.43 (0.29)	0.33 (0.19)	0.03
Cyclothymic	0.48 (0.48)	0.43 (0.29)	0.34
Hyperthymic	0.38 (0.29)	0.57 (0.29)	0.003
Irritable	0.29 (0.29)	0.36 (0.28)	0.47
Anxious	0.46 (0.27)	0.40 (0.27)	0.16

IQR – interquartile range

Table 8. **Influence of depressive and hyperthymic temperament on use of CBD more often than once a month – logistic regression analysis**

Temperament trait	Univariate model	
	OR [95% CI]	*p*
Depressive	0.33 [0.04–2.77]	0.31
Hyperthymic	0.73 [0.10–5.19]	0.75

OR – odds ratio; CI – confidence interval

Amount of used CBD forms

The distribution of temperament traits in the subgroups using CBD in different numbers of forms is shown in Table 9. The group using more than one form of CBD had a statistically significantly higher level of hyperthymia compared to those using one form of CBD ($p = 0.002$). A logistic regression test was then applied, which at the univariate analysis stage showed that there was no significant effect of hyperthymic temperament on taking more than 1 form of CBD, as shown in Table 10.

Table 9. **Severity of temperament traits according to TEMPS-A in CBD users in comparison subgroups distinguished by the number of used CBD forms**

Temperament trait [Median (±IQR)]	Number of used CBD forms		*p*
	1 form	More than 1 form	
Depressive	0.43 (0.19)	0.33 (0.24)	0.09
Cyclothymic	0.48 (0.38)	0.48 (0.36)	0.61
Hyperthymic	0.33 (0.38)	0.57 (0.29)	0.002
Irritable	0.29 (0.29)	0.39 (0.21)	0.35
Anxious	0.42 (0.31)	0.42 (0.31)	0.82

IQR – interquartile range

Table 10. **Effect of hyperthymic temperament on use of >1 form of CBD – logistic regression analysis**

Temperament trait	Univariate model	
	OR [95% CI]	*p*
Hyperthymic	0.97 [0.14–6.97]	0.98

OR – odds ratio; CI – confidence interval

Used forms of CBD

Differentiation of temperament traits in subgroups using different CBD forms is presented in Table 11. In a group of individuals using CBD in the form of dried flowers, a statistically significantly higher hyperthymia level and lower anxious temperament level, in comparison to ones not using CBD in dried flowers form, has been observed ($p = 0.014$; $p = 0.028$, respectively). After applying logistic regression in the univariate analysis stage, no association has been found between these features and the use of CBD in dried flowers form, as shown in Table 12.

Table 11. **Severity of temperament traits according to TEMPS-A in the compared groups using CBD (users and non-users of particular forms of CBD)**

Temperament trait [Median (±IQR)]	Use of CBD oil		*p*	Use of dried product		*p*	Use of other forms of CBD than oil and dried product		*p*
	Yes	No		Yes	No		Yes	No	
Depressive	0.38 (0.21)	0.38 (0.24)	0.63	0.36 (0.24)	0.43 (0.24)	0.15	0.38 (0.29)	0.38 (0.24)	0.67
Cyclothymic	0.45 (0.50)	0.48 (0.24)	0.55	0.48 (0.31)	0.43 (0.48)	0.92	0.52 (0.29)	0.45 (0.52)	0.57
Hyperthymic	0.55 (0.48)	0.38 (0.29)	0.53	0.50 (0.33)	0.33 (0.43)	**0.014**	0.48 (0.26)	0.38 (0.43)	0.10
Irritable	0.29 (0.26)	0.33 (0.29)	0.65	0.30 (0.31)	0.33 (0.19)	0.62	0.40 (0.23)	0.25 (0.29)	0.19
Anxious	0.44 (0.42)	0.42 (0.31)	0.64	0.40 (0.33)	0.50 (0.35)	**0.028**	0.42 (0.31)	0.40 (0.42)	0.46

IQR – interquartile range

Table 12. **Impact of hyperthymic and anxious temperament on the use of CBD dried product – logistic regression method**

Temperament trait	Univariate model	
	OR [95% CI]	*p*
Hyperthymic	0.09 [0.01-2.15]	0.13
Anxious	0.60 [0.06-6.45]	0.67

OR – odds ratio; CI – confidence interval

Knowledge of CBD concentrations in used products

There was no statistically significant impact of knowledge of CBD concentrations in used products on temperament, which is shown in Table 13.

Table 13. **Intensity of temperament traits according to TEMPS-A in the compared groups using CBD, aware (or unaware) of the used CBD concentration**

Temperament trait [Median (±IQR)]	Knowledge of CBD concentration in used product		*p*
	Yes	No	
Depressive	0.38 (0.24)	0.38 (0.29)	0.93
Cyclothymic	0.48 (0.52)	0.48 (0.19)	0.89
Hyperthymic	0.55 (0.38)	0.38 (0.29)	0.065
Irritable	0.32 (0.30)	0.30 (0.23)	0.86
Anxious	0.42 (0.35)	0.42 (0.38)	0.80

IQR – interquartile range

Concentrations of CBD in used products

Variations in temperament traits depending on concentrations of CBD in used products are presented in Table 14. The use of higher concentrations of CBD was associated with statistically significantly greater hyperthymic intensity compared to the use of lower concentrations of CBD ($p = 0.003$). However, it has not been confirmed in logistic regression, which is shown in Table 15.

Table 14. **Temperament traits severity based on TEMPS-A in compared groups using CBD (according to concentration of CBD in used product)**

Temperament trait [Median (±IQR)]	Concentration of CBD in used product				*p*
	<5%	5-10%	>10%	unknown concentration	
Depressive	0.43 (0.26)	0.33 (0.19)	0.33 (0.24)	0.38 (0.29)	0.41
Cyclothymic	0.40 (0.60)	0.43 (0.43)	0.48 (0.29)	0.48 (0.19)	0.77
Hyperthymic	0.31 (0.40)	0.57 (0.29)	0.62 (0.14)	0.38 (0.29)	0.0033
Irritable	0.28 (0.35)	0.30 (0.28)	0.43 (0.27)	0.30 (0.23)	0.61
Anxious	0.46 (0.31)	0.42 (0.38)	0.38 (0.19)	0.42 (0.38)	0.82

IQR – interquartile range

Table 15. **Intensity of the influence of hyperthymic temperament on the use of CBD with specific concentrations – a logistic regression analysis, univariate model**

Temperament trait	Use of CBD in concentration >5%		Use of CBD in concentration >10%	
	OR [95% CI]	*p*	OR [95% CI]	*p*
Hyperthymic	31.62 [0.49-2021.15]	0.09	5.55 [0.05-594.28]	0.45

OR – odds ratio; CI – confidence interval.

Differences between subjects of different genders

The severity of temperament traits depending on the use or non-use of CBD in female and male subgroups is presented in Table 16. A statistically significant relationship between CBD use and the severity of cyclothymic and irritable temperament traits was noted in the female group ($p = 0.01$; $p = 0.03$, respectively). No relationship between CBD use and severity of temperament traits was observed in males. Association between temperament traits in females and use of CBD has not been confirmed in logistic regression, which is shown in Table 17.

Table 16. **Severity of temperament traits in different groups according to TEMPS-A (depending on the use of CBD in gender-based subgroups).**

Temperament trait	Severity of the trait depending on the use of CBD [median (±IQR)]					
	Female		*p*	Male		*p*
	using CBD	not using CBD		using CBD	not using CBD	
Depressive	0.43 (0.24)	0.48 (0.29)	0.69	0.29 (0.24)	0.29 (0.24)	0.83
Cyclothymic	0.52 (0.29)	0.43 (0.33)	0.01	0.33 (0.33)	0.29 (0.48)	0.47
Hyperthymic	0.40 (0.38)	0.39 (0.29)	0.53	0.57 (0.29)	0.48 (0.33)	0.75
Irritable	0.43 (0.29)	0.24 (0.24)	0.03	0.25 (0.25)	0.30 (0.30)	0.69
Anxious	0.50 (0.31)	0.50 (0.35)	0.38	0.31 (0.31)	0.42 (0.31)	0.44

IQR – interquartile range

Table 17. **Influence of cyclothymic and irritable temperament on the use of CBD in women – a logistic regression analysis**

Temperament trait	Singla factor model	
	OR [95% CI]	*p*
Cyclothymic	0.84 [0.16-4.40]	0.84
Irritable	0.82 [0.10-6.88]	0.85

OR – odds ratio; CI – confidence interval

3. Substances other than CBD and temperament

The diversity of temperament traits in groups using and not using various substances and medications is presented in Table 18. In the group of cigarette smokers, a statistically significantly higher level of hyperthymia was observed compared to the non-smoking group ($p = 0.027$). In the group of individuals using non-opioid pain medications, a statistically significantly higher level of anxiety temperament was observed compared to those who did not use non-opioid pain medications ($p = 0.003$). In the group of individuals using opioids, a statistically significantly higher level of cyclothymia, irritability, and anxiety was observed compared to those who did not take opioids ($p = 0.04$; $p = 0.02$; $p = 0.004$, respectively). In the group of individuals using benzodiazepines, a statistically significantly higher severity of cyclothymic and anxiety temperament was observed compared to those who did not take benzodiazepines ($p = 0.02$; $p = 0.03$, respectively). In the group of individuals using non-benzodiazepine sleep medications, a statistically significantly higher severity of cyclothymic, irritable, and anxiety temperament traits was observed compared to those who did not use sleep medications ($p = 0.002$; $p = 0.02$; $p = 0.005$, respectively). In the group of marijuana users, a significantly lower severity of depression and anxiety, and a statistically significantly higher severity of hyperthymia were observed compared to non-marijuana smokers ($p = 0.0002$; $p = 0.03$; $p = 0.007$, respectively). A similar trend was observed in the group using amphetamine ($p = 0.02$; $p = 0.047$; $p = 0.006$, respectively). In the group of individuals using antidepressant medications, a statistically significantly higher level of depression, cyclothymia, and anxiety was observed compared to the group not using antidepressant medications ($p = 0.01$; $p = 0.004$; $p = 0.007$, respectively). In the group of individuals using other psychoactive substances, a significantly lower level of depressive temperament and a higher level of hyperthymia were observed compared to those who did not use them ($p = 0.01$; $p = 0.001$, respectively).

Table 18. **Differences in the severity of temperament traits according to TEMPS-A in individuals from the study group (depending on the use or non-use of drugs other than CBD)**

Psychoactive substance		Severity of temperament trait [Median (±IQR)]				
		Depressive	Cyclothymic	Hyperthymic	Irritable	Anxious
Cigarettes	yes	0.38 (0.29)	0.48 (0.38)	0.43 (0.33)	0.33 (0.24)	0.42 (0.38)
	no	0.43 (0.33)	0.38 (0.38)	0.38 (0.33)	0.24 (0.29)	0.42 (0.38)
	p	0.26	0.08	0.027	0.08	0.60
Analgesics	yes	0.43 (0.24)	0.43 (0.38)	0.38 (0.38)	0.25 (0.29)	0.50 (0.35)
	no	0.33 (0.29)	0.38 (0.33)	0.48 (0.33)	0.29 (0.30)	0.31 (0.27)
	p	0.0506	0.22	0.21	0.46	0.003
Opioids	yes	0.52 (0.05)	0.57 (0.14)	0.48 (0.48)	0.48 (0.14)	0.81 (0.19)
	no	0.43 (0.29)	0.43 (0.33)	0.38 (0.36)	0.25 (0.29)	0.42 (0.37)
	p	0.19	0.04	0.76	0.02	0.004

table continued on the next page

Benzodiazepines	yes	0.50 (0.19)	0.60 (0.33)	0.45 (0.33)	0.40 (0.14)	0.62 (0.38)
	no	0.43 (0.29)	0.43 (0.38)	0.38 (0.38)	0.25 (0.29)	0.42 (0.38)
	p	0.35	0.02	0.51	0.055	0.03
Hypnotic drugs	yes	0.48 (0.24)	0.60 (0.38)	0.45 (0.19)	0.41 (0.14)	0.62 (0.31)
	no	0.43 (0.29)	0.43 (0.38)	0.38 (0.38)	0.25 (0.29)	0.42 (0.38)
	p	0.34	0.002	0.17	0.02	0.005
Marijuana	yes	0.33 (0.24)	0.48 (0.33)	0.43 (0.29)	0.30 (0.30)	0.38 (0.35)
	no	0.48 (0.29)	0.38 (0.38)	0.38 (0.33)	0.24 (0.29)	0.46 (0.35)
	p	0.0002	0.14	0.007	0.25	0.03
Amphetamine	yes	0.26 (0.10)	0.52 (0.19)	0.69 (0.24)	0.38 (0.27)	0.23 (0.27)
	no	0.43 (0.33)	0.43 (0.33)	0.38 (0.38)	0.25 (0.29)	0.42 (0.38)
	p	0.02	0.16	0.006	0.16	0.047
Antidepressants	yes	0.57 (0.14)	0.60 (0.19)	0.36 (0.24)	0.40 (0.24)	0.58 (0.23)
	no	0.38 (0.29)	0.38 (0.38)	0.43 (0.38)	0.25 (0.29)	0.42 (0.38)
	p	0.01	0.004	0.46	0.23	0.007

IQR – interquartile range

The use of CBD and substances other than CBD

Differences in the proportions of people using specific substances and medications in subgroups using and not using CBD are presented in Table 19. In the CBD-using group, a significantly higher percentage of individuals smoked cigarettes and marijuana (p <0.001; p <0.001, respectively). A statistically significantly lower percentage of individuals in the CBD-using group used non-opioid analgesics (p = 0.006).

Table 19. **Differences in percentage of people using other psychoactive substances and drugs in compared groups (using and non-using CBD)**

Psychoactive substance/medicine	**Amount and percentage of individuals using given drug/medicine**				***p***
	Group using CBD		Group non-using CDB		
	Amount of people	Subgroup percentage	Amount of people	Subgroup percentage	
Cigarettes	34	59.65%	35	30.17%	<0.001
Non-opioid analgesics	37	64.91%	98	84.48%	0.006
Marijuana	38	66.67%	18	15.52%	<0.001

OR – odds ratio; CI – confidence interval

By using logistic regression analysis in both univariate and multivariate models, it was confirmed that smoking cigarettes and marijuana, as well as not using non-opioid analgesics, are predictors of CBD use. Similarly, CBD use is a predictor of smoking cigarettes and marijuana and not using non-opioid analgesics. These data are illustrated in Tables 20 and 21. Furthermore, increased anxious temperament is associated with more frequent use of non-opioid pain medications, opioids, and benzodiazepines, while lower levels of depressive temperament are associated with marijuana use, as shown in Table 21. Other associations were not confirmed in the regression models.

Table 20. **Smoking cigarettes and marijuana and use of non-opioid analgesics as predictors of CBD use – a logistic regression analysis**

Used substance	Univariate model		Multivariate model	
	OR [95% CI]	*p*	OR [95% CI]	***p***
Marijuana	10.89 [5.14-23.07]	<0.000001	9.04 [4.10-19.92]	**<0.000001**
Cigarettes	3.42 [1.76-6.66]	0.0003	2.42 [1.10-5.30]	**0.03**
Non-opioid analgesics	0.34 [0.16-0.72]	0.004	0.31 [0.13-0.76]	**0.010**

OR – odds ratio; CI – confidence interval.

Table 21. **Relationship between the temperament trait according to TEMPS-A and use of psychoactive substance – a logistic regression analysis**

Substance used	Feature	Univariate model		Multivariate model	
		OR [95% CI]	*p*	OR [95% CI]	*p*
Cigarettes	CBD use	3.42 [1.76-6.66]	0.0003	3.25 [1.65-6.37]	**0.0006**
	Hyperthymic temperament	5.36 [1.20-23.86]	0.03	4.31 [0.92-20.23]	0.06
Non-opioid analgesics	CBD use	0.34 [0.16-0.72]	0.004	0.33 [0.15-0.71]	**0.004**
	Anxious temperament	10.31 [1.94-54.71]	0.006	11.13 [1.97-62.75]	**0.006**
Opioids	Cyclothymic temperament	64.18 [0.90-4594.02]	0.054	–	–
	Irritable temperament	230.38 [1.65-32130.45]	0.03	14.87 [0.07-3178.38]	0.32
	Anxious temperament	2099.54 [5.04-874377.4]	0.01	933.19 [1.56-557550.6]	**0.03**
Benzodiazepines	Cyclothymic temperament	35.41 [1.80-697.76]	0.18	–	–
	Anxious temperament	24.05 [1.32-439.39]	**0.03**	–	–

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Hypnotic drugs	Cyclothymic temperament	38.98 [3.81-398.80]	0.002	10.07 [0.50-03.00]	0.13
	Irritable temperament	36.11 [2.38-548.65]	0.009	2.54 [0.08-85.99]	0.60
	Anxious temperament	23.49 [2.52-219.15]	0.005	5.93 [0.40-87.272]	0.19
Marijuana	CBD use	10.89 [5.14-23.07]	<0.0001	11.81 [5.22-26.72]	<0.0001
	Depressive temperament	0.02 [0.003-0.16]	0.0001	0.008 [0.0002-0.26]	0.006
	Hyperthymic temperament	9.31 [1.88-45.96]	0.005	1.26 [0.14-11/39]	0.84
	Anxious temperament	0.23 [0.06-0.94]	0.04	2.56 [0.22-29.04]	0.45
Amphetamine	Depressive temperament	0.001 [0.000002-0.70]	0.04	0.05 [0.000003-802.24]	0.54
	Hyperthymic temperament	724.08 [4.16-126110.1]	0.01	203.31 [0.65-63445.18]	0.07
	Anxious temperament	0.02 [0.0003-1.39]	0.07	0.26 [0.0007-91.71]	0.65
Antidepressants	Depressive temperament	22.72 [1.51-342.28]	0.02	6.90 [0.34-140.44]	0.21
	Cyclothymic temperament	24.10 [2.26-257.60]	0.008	13.04 [0.98-174.36]	0.051
	Anxious temperament	6.90 [0.43-110.07]	0.17	–	–

OR– odds ratio; CI – confidence interval.

Amount of used drugs or medicines

Differences in severity of individual temperament traits in subgroups differentiated by the amount of used psychoactive substances is presented in Table 22. Individuals using more than 3 drugs or medicines (not CBD) stood out with statistically significantly higher levels of cyclothymia, hyperthymia, and irritability in comparison to individuals using 3 drugs/medicines or less (p <0.0001; p = 0.006; p = 0.008, respectively). Multivariate logistic regression analysis confirmed association between high level of cyclothymic and hyperthymic traits and use of more than 3 drugs, which is shown in Table 23.

Table 22. **Differences in severity of temperament traits in subgroups (differentiated the amount of used psychoactive substances other than CBD)**

Temperament trait	Trait severity depending on the amount of used drug/medicine [Median (±IQR)]		
	≤3 substances	>3 substances	*p*
Depressive	0.43 (0.33)	0.43 (0.24)	0.48
Cyclothymic	0.38 (0.33)	0.57 (0.29)	**<0.0001**
Hyperthymic	0.38 (0.33)	0.48 (0.24)	**0.006**
Irritable	0.24 (0.27)	0.38 (0.23)	**0.008**
Anxious	0.42 (0.37)	0.50 (0.42)	0.31

IQR – interquartile range; OR – odds ratio; CI – confidence interval

Table 23. **Influence of temperament traits according to TEMPS-A on use of more than 3 psychoactive substances other than CBD – a logistic regression analysis**

Temperament trait	Univariate model		Multivariate model	
	OR [95% CI]	*p*	OR [95% CI]	*p*
Cyclothymic	37.11 [6.29-218.94]	**0.00005**	81.84 [7.53-889.91]	**0.0003**
Hyperthymic	12.07 [1.92-75.66]	**0.007**	26.11 [3.44-198.23]	**0.001**
Irritable	15.12 [1.95-116.94]	**0.009**	0.53 [0.03-8.92]	0.66

OR – odds ratio. CI – confidence interval

Discussion

The question persists whether the severity of these temperament traits is a cause or a result of more frequent use of substances with psychotropic effect.

As previously mentioned, many researchers, including Yakovlev et al. [3], Shahini et al. [4], Schneider et al. [5], and Gerra et al. [6] indicate that an increased (according to TCI) level of novelty-seeking (which, according to TEMPS-A would correspond to a high level of hyperthymia and/or cyclothymia) and deterioration of self-directedness predispose to higher tendencies to use psychoactive substances and addiction [see also 23, 28]. Shahini et al. [4] also draw attention to the correlation of addiction tendencies with lower results in the areas of cooperativeness, self-transcendence, and persistence. Moreover, both Ohannessian et al. [29] and Windle [30] observed that childhood behavioral disorders are a predictive factor for adult behavioral disorders, including substance use and abuse. On the other hand, long-term use of psychoactive substances as medicines or recreational drugs can lead to the modulation of certain temperament traits, which is supported by many reports [31–34].

It is worth noting that according to some studies, the severity of specific temperament traits differs when using different psychoactive substances. Infortuna et al. [35]

observed that marijuana users had significantly higher levels of cyclothymia and irritability. On the other hand, Unseld et al. [36] found a significantly lower level of depressiveness in this group. This is partially consistent with the results of this study, where individuals who smoked marijuana showed significantly lower levels of depressiveness, however, lack of higher level of cyclothymia and irritability was observed. Unseld et al. [36] also found that nicotine use was associated with particularly irritable temperament. However, in our study, the group of cigarette smokers did not show significant differences in temperament traits in comparison to non-smokers.

According to Unseld et al. [36] and Moore et al. [37], individuals who consume alcohol typically have higher levels of irritability. Khazaal et al. [38] observed that a high level of irritability also contributed to drug abuse in the group of alcohol-dependent individuals, while in the group of opioid-dependent individuals, a predisposing factor for harmful alcohol consumption appeared to be a high level of anxiety, with hyperthymic temperament seeming to be a protective factor against alcohol abuse. Milivojevic et al. [21] indicated a high level of novelty seeking and harm avoidance in the group of alcohol-dependent individuals (known as a sensitive temperament configuration according to Cloninger, which according to TEMPS-A can correspond to high level of cyclothymia and/or depression [see 28]. This is inconsistent with the results of our study, as we did not find significant differences in temperament between the alcohol-using group and the non-alcohol-using group.

According to Moore et al. [37], individuals using opioids had significantly higher levels of depression and hyperthymia, as well as, according to Milivojevic et al. [21], significantly greater novelty-seeking tendencies (which corresponds to high level of hyperthymia and/or cyclothymia, according to TEMPS-A) [28]. However, according to Amirabadi et al. [39], predictive factors for opioid addiction are not novelty-seeking but low self-control and cooperation. This is not fully consistent with the results of our study; in our study group, the use of opioids correlated with higher levels of anxiety, and other significant differences compared to non-users of opioids were not confirmed. Additionally, correlation coefficients indicated stronger relationships between the severity of anxiety traits and the frequency of use of benzodiazepines and non-opioid analgesics.

The reason for the discrepancies between the results of our study and other studies on the relationship between temperament traits and the use of psychoactive substances (other than CBD) may lie in the different selection of the study group in terms of socio-demographic characteristics. The discrepancies may also be attributed to different definitions of substance use used to qualify participants for the study (e.g., "use", "harmful use", or "addiction"). Another reason for the discrepancies could be the different approach to assessing traits in the TEMPS-A and TCI questionnaires, which describe traits only partially comparable.

Consistently emerging from various studies is the significance of the novelty-seeking trait as a predictive factor for the propensity to use psychoactive substances, which according to TEMPS-A corresponds to high level of cyclothymia and/or hyperthymia [28]. Chakroun et al. [40] demonstrated, however, that the highest intensity of this trait occurs in individuals using illegal and most health-threatening substances,

such as heroin or cocaine, while it is lowest in individuals not using any psychoactive substances, and this relationship is linear. Gerra et al. [41], describing the behaviors of school-age youth, indicate that aggression and the pursuit of strong stimuli are characteristic of individuals abusing alcohol and a large number of substances, including illegal ones. The use of illegal and most health-threatening substances is also associated with lower levels of harm avoidance and persistence [42] and may result from immaturity or even personality disorders [21].

The quoted data suggest that the severity of individual temperament traits can be both a cause and a consequence of using various psychoactive substances. Traits such as novelty-seeking, strong stimulus responsiveness, or aggression proneness are particularly heightened in addicted individuals with dangerous behaviors who use numerous psychoactive substances, including illegal ones.

The use of CBD carries potential side effects, however, it appears to be a much less harmful substance for health compared to other substances of abuse. Importantly, CBD can be legally obtained [17,18]. In a study by Schoedel et al. [43] involving healthy individuals with a history of using psychoactive substances, therapeutic doses of CBD (750 mg) demonstrated an addictive potential that did not significantly differ from placebo, while supratherapeutic doses of CBD (1500 mg and 4500 mg) showed significantly lower addictive potential compared to alprazolam and dronabinol (synthetic THC).

There is a lack of research describing the relationship between temperament traits and the way of using CBD. However, the aforementioned data suggest that such correlations would be expected in a group of individuals using a greater number of substances or medications with higher frequency, rather than in the entire group using CBD. This is consistent with the findings of the current study. In the study group, nearly half of the CBD users (47%) used this substance less than once a month, and just over half (51%) used CBD only in one form. It was shown that the group of CBD users did not exhibit any statistically significant differences in temperament traits according to TEMPS-A compared to the non-CBD group. The duration of CBD use, frequency of use, level of CBD concentration, form and amount of forms of CBD also did not have a significant impact. However, individuals using more than 3 psychoactive substances or medications showed significantly higher levels of cyclothymia and hyperthymia, which correspond to high level of novelty-seeking according to Cloninger [see 28].

It is also noteworthy that individuals using CBD smoked cigarettes and marijuana significantly more often compared to those who did not use CBD. This suggests a greater exposure of CBD users to the negative effects of nicotine and THC in terms of potential side effects and legal consequences. On the other hand, according to Karimi-Haghighi et al. [44], the way CBD regulates reward system functions may be beneficial in the treatment of addictions. It also seems beneficial that people using CBD reach for non-opioid pain medications less frequently, as this reduces exposure to the side effects of their chronic use, such as peptic ulcers as a complication of NSAIDs.

Differences between groups distinguished by gender could be expected due to differences in temperament traits according to TEMPS-A observed in studies of the

Polish population between women and men [22, 45]. However, in the current study, no modification of the impact of temperament on CBD use by gender was confirmed.

Limitations of the study

A limitation of the current study is the fact that respondents were not asked about the reasons for using CBD. However, it can be presumed that the motivation for using CBD in the study group was the desire to experience typical effects of CBD, such as anti-anxiety or pain-relieving effects. This is supported by the fact that CBD users significantly less frequently used non-opioid analgesic medications compared to non-CBD users. Limitations also arose in terms of the selection of participants for the sample. It was not possible to include an equal number of males and females to a study and control group as well as equal number of subjects with different levels of education. The method of data gathering was also a limitation – questionnaire has been distributed via social media platforms, which disqualifies from the study people not using this type of platforms. Completing the online survey independently by participants increase risk of acquisition of data inconsistent with the facts, hence results should be treated as a supplementation of the current knowledge state based on the studies with more credible methodology.

Recapitulation

In the studied group, 32.95% of individuals used CBD. No significant association was found between CBD use and the severity of specific temperament traits according to TEMPS-A, regardless of the duration of CBD use, frequency of use, forms, or concentrations in the products. A significantly higher level of cyclothymia and hyperthymia was noted in individuals using more than 3 different psychoactive substances or medications besides CBD. An association was observed between anxious temperament and more frequent use of opioids, non-opioid pain medications, and benzodiazepines, as well as a negative correlation between depressive temperament and marijuana use. CBD use predisposes individuals to more frequent smoking of cigarettes and marijuana and less frequent use of non-opioid pain medications.

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Attachment

Ankieta „Cechy temperamentu na podstawie skali TEMPS-A a używanie CBD oraz innych substancji psychoaktywnych i leków – badanie oryginalne”

1. Wiek (proszę podać liczbę całkowitą) ……
2. Płeć
   - ☐ K
   - ☐ M
3. Miejsce zamieszkania
   - ☐ Wieś
   - ☐ Miasto do 10 tys. mieszkańców
   - ☐ Miasto powyżej 10 tys. mieszkańców, do 50 tys. mieszkańców
   - ☐ Miasto powyżej 50 tys. mieszkańców, do 100 tys. mieszkańców
   - ☐ Miasto powyżej 100 tys. mieszkańców, do 250 tys. mieszkańców
   - ☐ Miasto powyżej 250 tys. mieszkańców
4. Wykształcenie
   - ☐ podstawowe
   - ☐ średnie
   - ☐ zawodowe
   - ☐ wyższe
5. Od jak dawna stosuje Pan/i CBD?
   - ☐ miesiąc lub krócej
   - ☐ powyżej 1 miesiąca, do 6 miesięcy
   - ☐ powyżej 6 miesięcy, do 1 roku
   - ☐ powyżej 1 roku, do 2 lat
   - ☐ powyżej 2 lat
6. Jak często (w przybliżeniu) stosuje Pan/i CBD?
   - ☐ rzadziej niż 1 raz w miesiącu
   - ☐ od 1 do 3 razy w miesiącu
   - ☐ od 1 do 3 razy w tygodniu
   - ☐ częściej niż 3 razy w tygodniu
   - ☐ częściej niż 1 raz dziennie
7. W jakiej formie stosuje Pan/i CBD? (można zaznaczyć więcej niż jedną odpowiedź)
   - ☐ Olej
   - ☐ Kapsułki
   - ☐ Pasty
   - ☐ Izolat
   - ☐ Susz
   - ☐ Meladol (CBD z melatoniną)
   - ☐ Spray do nosa
   - ☐ E-liquid

- ☐ Inhalator
- ☐ Krem
- ☐ Kosmetyki inne niż kremy
- ☐ Inne – jakie? .....

8. Jakie stężenia CBD według producenta znajdują się w stosowanych przez Pana/Panią preparatach?
   - ☐ 3% lub mniej
   - ☐ więcej niż 3%, do 5%
   - ☐ więcej niż 5%, do 10%
   - ☐ więcej niż 10%, do 15%
   - ☐ więcej niż 15%
   - ☐ nie wiem/nie mam pewności

Czy stosuje Pan/i któreś z poniższych środków?

	Nigdy nie stosowałam/em	Stosowałam/em w przeszłości, ostatnio ponad pół roku temu	Rzadziej niż 1 raz w miesiącu	1–3 razy w miesiącu	1–3 razy w tygodniu	Częściej niż 3 razy w tygodniu	Częściej niż 1 raz dziennie
Alkohol							
Papierosy							
Leki przeciwbólowe nieopioidowe (np. ibuprofen, paracetamol, ketonal)							
Opioidy							
Benzodiazepiny							
Leki nasenne niebenzodiazepinowe							
Marihuana							
Amfetamina							
Dysocjanty (fencyklidyna, dekstrometorfan, ketamina)							
Leki antydepresyjne							
Leki neuroleptyczne							
Inne substancje psychoaktywne							

Proszę zakreślić **T (tak)** we wszystkich przypadkach, w których dane zdanie jest prawdziwe dla większej części Pan/i życia. Proszę zakreślić **N (nie)** we wszystkich innych przypadkach, w których stwierdzenia nie odnoszą się do większej części Pan/i życia.

1.	T	N	Jestem smutną, nieszczęśliwą osobą.
2.	T	N	Ludzie mówią mi, że nie potrafię dostrzec jasnej strony życia.
3.	T	N	Doświadczyłem/am wielu cierpień w swoim życiu.
4.	T	N	Myślę, że sprawy zwykle kończą się bardzo źle.
5.	T	N	Łatwo się poddaję.
6.	T	N	Odkąd pamiętam, zawsze czułem/am się jak przegrany/a.
7.	T	N	Zawsze obwiniałem/am się o coś, czego inni nie uważali za wielki problem.
8.	T	N	Wydaje mi się, że mam mniej energii niż inni ludzie.
9.	T	N	Jestem osobą, która nie za bardzo lubi zmiany.
10.	T	N	Gdy jestem w grupie, wolę słuchać, niż mówić.
11.	T	N	Często ustępuję innym.
12.	T	N	Czuję się bardzo skrępowany/a, spotykając nowych ludzi.
13.	T	N	Łatwo zranić moje uczucia poprzez krytykę lub odrzucenie.
14.	T	N	Jestem osobą, na której zawsze można polegać.
15.	T	N	Potrzeby innych osób przedkładam nad moje własne.
16.	T	N	Jestem osobą ciężko pracującą.
17.	T	N	Wolę pracować dla kogoś, niż być szefem.
18.	T	N	Naturalne dla mnie jest bycie uporządkowanym/ą i zorganizowanym/ą.
19.	T	N	Jestem osobą, która we wszystko wątpi.
20.	T	N	Mój popęd płciowy był zawsze niewielki.
21.	T	N	Zwykle potrzebuję ponad 9 godzin snu.
22.	T	N	Często czuję się zmęczony/a bez powodu.
23.	T	N	Miewam nagłe zmiany nastroju i energii.
24.	T	N	Mój nastrój i poziom energii są bardzo wysokie lub niskie, rzadko znajdują się pośrodku.
25.	T	N	Moja zdolność do myślenia waha się znacznie, od dobrego skupienia do braku koncentracji, bez istotnych powodów.
26.	T	N	Mogę kogoś naprawdę lubić, a potem całkowicie stracić nim zainteresowanie.
27.	T	N	Często wybucham gniewem wobec ludzi i czuję się z tego powodu winny/a.
28.	T	N	Często zaczynam jakąś czynność i tracę nią zainteresowanie, nie kończąc jej.
29.	T	N	Mój nastrój często zmienia się bez powodu.
30.	T	N	Mój nastrój ciągle się zmienia: od żywotności po znużenie.
31.	T	N	Niekiedy kładę się spać, czując się źle, ale budzę się w doskonałym nastroju.
32.	T	N	Niekiedy kładę się spać, czując się świetnie, ale budząc się rano, czuję, że nie warto żyć.

33.	T	N	Często mówią mi, że mam pesymistyczne nastawienie do świata i zapominam o wcześniejszych szczęśliwych czasach.
34.	T	N	Waham się pomiędzy poczuciem nadmiernej pewności siebie i braku wiary w siebie.
35.	T	N	Waham się pomiędzy byciem człowiekiem towarzyskim i wycofanym z życia społecznego.
36.	T	N	Silnie odczuwam wszystkie emocje.
37.	T	N	Moja potrzeba snu różni się znacznie, od kilku godzin do ponad 9 godzin na dobę.
38.	T	N	Niekiedy postrzegam otoczenie w wesołych barwach, a niekiedy jako całkowicie bezbarwne.
39.	T	N	Jestem osobą, która potrafi być jednocześnie smutna i wesoła.
40.	T	N	Dużo marzę o rzeczach, które inni uważają za niemożliwe do osiągnięcia.
41.	T	N	Często odczuwam silną potrzebę dokonywania skandalicznych czynów.
42.	T	N	Jestem osobą, która szybko się zakochuje i odkochuje.
43.	T	N	Zwykle jestem w dobrym lub radosnym nastroju.
44.	T	N	Życie jest świętem, które obchodzę najweselej jak potrafię.
45.	T	N	Lubię opowiadać dowcipy, ludzie mówią mi, że mam poczucie humoru.
46.	T	N	Jestem osobą, która uważa, że wszystko w końcu skończy się dobrze.
47.	T	N	Mam duże zaufanie do siebie.
48.	T	N	Często mam dużo wspaniałych pomysłów.
49.	T	N	Jestem ciągle w biegu.
50.	T	N	Mogę wykonać wiele zadań i nawet wtedy nie jestem zmęczony/a.
51.	T	N	Mam dar przemawiania, przekonywania i inspirowania innych osób.
52.	T	N	Uwielbiam mierzyć się z nowymi projektami, nawet jeśli są one ryzykowne.
53.	T	N	Gdy zdecyduję, że czegoś dokonam, nic nie może mnie zatrzymać.
54.	T	N	Czuję się całkowicie pewnie, nawet z ludźmi, których słabo znam.
55.	T	N	Lubię przebywać z dużą liczbą ludzi.
56.	T	N	Ludzie mówią mi, że często wtrącam się w nie swoje sprawy.
57.	T	N	Jestem znany/a z tego, że jestem hojny/a i wydaję dużo pieniędzy na potrzeby innych osób.
58.	T	N	Posiadam zdolności i doświadczenie w wielu dziedzinach.
59.	T	N	Czuję, że mam prawo i przywilej postępować tak jak mi się podoba.
60.	T	N	Jestem osobą, która lubi być szefem.
61.	T	N	Gdy się z kimś nie zgadzam, mogę używać siły fizycznej.
62.	T	N	Mój popęd płciowy jest zawsze duży.
63.	T	N	Zwykle nie potrzebuję więcej niż 6 godzin snu na dobę.
64.	T	N	Jestem zrzędliwą (drażliwą) osobą.

65.	T	N	Z natury jestem niezadowolony/a.
66.	T	N	Dużo narzekam.
67.	T	N	Jestem bardzo krytyczny/a wobec innych.
68.	T	N	Często czuję się nerwowy/a.
69.	T	N	Często odczuwam bardzo silne napięcie.
70.	T	N	Napędza mnie nieprzyjemny niepokój, którego nie rozumiem.
71.	T	N	Często jestem tak wściekły/a, że mógłbym/mogłabym zniszczyć wszystko wokół siebie.
72.	T	N	Gdy ktoś mi się sprzeciwia, mogę wdać się w bójkę.
73.	T	N	Ludzie mówią mi, że wybucham bez powodu.
74.	T	N	Gdy jestem zły/a, krzyczę na ludzi.
75.	T	N	Lubię droczyć się z ludźmi, nawet z tymi, których nie znam.
76.	T	N	Moje cięte poczucie humoru przysporzyło mi wiele kłopotów.
77.	T	N	Mogę być tak wściekły/a, że mogę zrobić komuś krzywdę.
78.	T	N	Jestem tak zazdrosny/a o moją żonę/mojego męża (lub kochankę/a), że nie mogę tego znieść.
79.	T	N	Jestem znany/a z tego, że wiele przeklinam.
80.	T	N	Mówiono mi, że staję się agresywny/a zaledwie po kilku drinkach.
81.	T	N	Jestem bardzo sceptyczną osobą.
82.	T	N	Mógłbym/mogłabym być buntownikiem/buntowniczką.
83.	T	N	Mój popęd płciowy jest często tak nasilony, że jest to naprawdę nieprzyjemne.
84.	T	N	(Tylko kobiety): tuż przed okresem mam nagłe ataki niekontrolowanego gniewu.
85.	T	N	Odkąd tylko pamiętam, zawsze dużo się martwiłem/am.
86.	T	N	Zawsze martwię się o jakąś sprawę.
87.	T	N	Ciągle martwią mnie codzienne sprawy, które inni uważają za mało istotne.
88.	T	N	Nie mogę przestać się martwić.
89.	T	N	Wiele osób mówiło, bym nie martwił/a się tak wiele.
90.	T	N	W sytuacjach napięcia mam często pustkę w głowie.
91.	T	N	Nie potrafię się odprężyć.
92.	T	N	Często czuję się wewnętrznie roztrzęsiony/a.
93.	T	N	W sytuacjach napięcia często trzęsą mi się ręce.
94.	T	N	Często odczuwam dyskomfort w brzuchu.
95.	T	N	Gdy jestem zdenerwowany/a, miewam biegunkę.
96.	T	N	Gdy jestem zdenerwowany/a, często odczuwam nudności.
97.	T	N	Gdy jestem zdenerwowany/a, częściej chodzę do toalety.
98.	T	N	Gdy ktoś do późna nie przychodzi do domu, martwię się, że mógł mieć wypadek.

99.	T	N	Często martwię się, że ktoś w mojej rodzinie może zachorować na ciężką chorobę.
100.	T	N	Często myślę, że ktoś może przekazać mi złą wiadomość na temat członka mojej rodziny.
101.	T	N	Mój sen jest niespokojny.
102.	T	N	Mam często problemy z zasypianiem.
103.	T	N	Jestem z natury bardzo ostrożną osobą.
104.	T	N	Często budzę się w nocy, myśląc, że włamywacze są w moim domu.
105.	T	N	Gdy jestem zdenerwowany/a, często boli mnie głowa.
106.	T	N	Gdy jestem spięty/a, mam nieprzyjemne uczucie w klatce piersiowej.
107.	T	N	Mam małe poczucie bezpieczeństwa.
108.	T	N	Nawet niewielkie zmiany w codziennych zajęciach powodują, że jestem bardzo spięty/a.
109.	T	N	Podczas prowadzenia samochodu, nawet gdy nie zrobię nic złego, obawiam się, że może zatrzymać mnie policja.
110.	T	N	Reaguję strachem na gwałtowne hałasy.