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# Issues of Psychological Research on the Relationship Between Students' Depression Indicators and Temperament Characteristics

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## Abstract

The study investigated the psychological aspects of the relationship between students' depression indicators and temperament characteristics. Within the framework of the study, the depression levels of students with different temperament types were analyzed comparatively. Standard psychodiagnostic methods were used in the empirical study, and the results obtained were processed using statistical methods. The results showed that there is a significant relationship between temperament characteristics and depression indicators. The results of the study show that individual psychological characteristics, especially temperament, have a significant impact on the emotional state and tendency to depression of students. The results of

the statistical analysis showed that there is a statistically significant, positive relationship between temperament and depression level ( $r=0.293^*$ ;  $p=0.011$ ). The fact that the obtained p value is less than 0.05 ( $p < 0.05$ ) confirms that this relationship is not random and is statistically significant. As a result, it is necessary to take into account temperament characteristics in order to prevent depression among students and protect mental health. The research creates a scientific basis for improving psychological services in higher education institutions and identifies promising directions for future research.

**Keywords:** Education System, Students, Depressive Indicators, Temperament Characteristics, Psychological Research

## 1. INTRODUCTION

Assessment of students' mental health is an important part of psychological service and preventive work. One of the most common and difficult problems in this area is the identification of symptoms of depression and the systematization of factors affecting its development. In this regard, modern research is looking for optimal ways to diagnose depressive disorders among students and is trying to study the relationship between depressive disorders and temperament types of students [1].

In various studies, a two-factor model was used to explain the relationship between temperament, anxiety, depression and hopelessness, and the reliability of affective temperaments was tested to predict the risk of psychiatric morbidity and suicide [2]. It was found that depression, anxiety and hopelessness are in a complex relationship, partially mediated by temperament. In addition, in separate studies, the relationship between the quality of life of students and the level of depressive disorders was examined taking into account temperament. Studies have shown that anxiety-depressive disorders are observed in approximately 10% of the general population. Approximately 450 million people experience these disorders during their lifetime [3].

Depressive syndrome is observed three times more often in health workers than in the general population, and the frequency of combined disorders is similar to that observed in people with chronic pain syndromes [4]. In this regard, the study of the relationship of depressive syndrome in students with their temperament types is very relevant. Currently, great attention is paid to the development of competencies in students in the education system. Therefore, students should be ready to apply their knowledge and skills in specific situations. Academic performance, readiness to solve various problems, and suitability for various types of work depend on temperament and quality of life [5].

Akiskal [6] suggested that temperament dysregulation is the main pathology of mood disorders and that its presence in individuals reflects an increased tendency to develop affective disorders. In addition, specific affective temperament types (depressive, cyclothymic, hyperthymic, irritable, and anxious) have a strong association with suicidal behavior [7]. A study of affective temperaments in suicide attempts showed that suicide attempts scored significantly higher in four out of five affective temperaments, which contained a more or less depressive component, compared to the control group [8].

The intense pace of life and education creates a huge burden on all body systems. Since students' adaptive mechanisms are not fully developed, intensive activity and significant psycho-emotional stress can lead to maladaptation of the autonomic and endocrine systems, disruption of higher nervous activity and the emotional sphere, and, as a result, can become a link in the pathogenesis of depressive diseases, which leads to a decrease in performance and an increase in biological age [9]. In addition, temperament or personality types can affect work style, stress resistance, and the ability to cope with psycho-emotional stress, as well as the occurrence of depressive symptoms, including success at work and school.

## 2. LITERATURE REVIEW

Depression is a mental illness characterized by mood disorders. The main symptoms are: joyless, depressed state, loss of pleasure; lack of interest; inability to concentrate, memory impairment; inability to make decisions, obsessive return to the same issues; fear, inner anxiety, feeling of fatigue, lack of energy, sleep disorders, loss of appetite, weight loss, lack of sexual interest, pressure in the abdomen and chest, feeling of heaviness, vegetative symptoms, etc. [10].

In general, women and men have similar depressive symptoms, but when clinically clarified, some differences can be detected. Symptoms of female depression are more orthodox, accompanied by strong emotional distress, help-seeking and a high level of comorbid anxiety disorders.

Studies show that energy potential varies depending on temperament: in phlegmatic people it is quite strong and stable, in choleric people it is strong, but quickly depleted, in melancholic people it is weak and unstable, and in sanguine people it manifests itself at a high level only episodically under the influence of favorable circumstances [11–13]. Temperament is the innate biological basis on which personality is formed. The maximum speed of reaction, the speed of assimilation of change, the inertia of decision-making and the pulsation rhythm are dynamic aspects of behavior determined by temperament [11–14].

A person's temperament determines how easily his emotional arousal occurs, what intensity it will be, what mood background will prevail, and how easily it can change [11, 14, 15]. The system of temperament constraints can be thought of as a framework within which individual development takes place. All this predetermines performance and reaction to crisis situations. Innate temperamental traits are somewhat softened through development and learning, as well as under the influence of cultural traditions. The more important a person's compliance with social and ethical norms is for them, the greater this softening will be.

According to the model of Cloninger and colleagues, personality can be defined as individual differences in relation to adaptive systems for receiving, processing, and storing information and experiences [16]. This psychobiological theory of personality was first formulated in two stages in the late 80s and early 90s, when the main definitions were proposed. Temperament is understood as automatic responses to environmental stimuli that are associated with the individual's

implicit memory and are associated with neurobiological predispositions. In other words, temperament is related to the logical pre-emotional processes of associative conditioning. However, character represents a more complex cognitive process related to semantics or explicit memory. It is defined as the rational restructuring of perceptions and experiences, which transforms them into concepts and gives them meaning [16].

In the conducted studies, four dimensions of temperament have been identified: harm avoidance, novelty seeking, reward dependence and persistence. The temperament dimension called harm avoidance is characterized by anticipatory pessimistic concerns about future events, fear of the unknown and shyness with strangers, which leads to avoidance behavior in which the individual tries to stay away from difficulties or participation in new situations. The novelty-seeking dimension, on the other hand, is characterized by impulsive behavior, exploration for novelty and pleasure, and low tolerance for frustration. In these situations, these individuals may often exhibit explosive behavior with emotional withdrawal [17].

The third dimension of temperament is reward dependence, which is characterized by a high affection for social relationships and a high value placed on external approval by the individual. These individuals are generally more sentimental and sensitive to hurt [16].

For the final dimension of temperament, perseverance, willpower is a key feature and can be described as the tendency not to give up easily on goals. Initially, this was considered a sub-item of the previous dimension, but it was later shown to be a fourth heritable dimension of temperament that should be considered separately [16, 17].

Studies have shown significant relationships between certain temperament trait dimensions, character aspects, and resilience. Harm avoidance and novelty seeking were predisposing traits, along with resilience aspects such as resilience, impulsivity, and cooperation, that explained a significant amount of variance in depression. The main goal of our study was to develop an individualized psychological model for students with temperament and prodromal-mild depression. It consists of determining how the input can affect development.

### 3. METHODOLOGY

#### 3.1. DESIGN

It should be noted that there are few studies devoted to the study of strategies for determining the relationship between temperament types and depression levels in students. In this regard, the aim of our study was to identify the relationship between temperament types and depression levels in students. For this purpose, a quantitative and qualitative sample was used.

#### 3.2. PARTICIPANTS

This study aims to determine the relationship between temperament types and depression levels in students. A quantitative, correlational research model was applied in the study. Within the framework of the study, the role of temperament characteristics in the formation of depressive states of undergraduate students of Baku State University aged 18-25 and the statistical dependencies between these variables were analyzed. In accordance with the purpose of the study, a scientific-theoretical methodology was used that allows determining the relationship (correlation) between events through quantitative indicators. 99.5% of students of both sexes participated in regular classes. They were offered various methods and their consent was obtained. No work was done against anyone's will in the study. The composition of the participants by temperament type is as follows:

- Choleric: 22 people (19.1%)
- Sanguine: 40 people (34.8%)
- Phlegmatic: 32 people (27.8%)
- Melancholic: 21 people (18.3%)

It should be noted that in order to ensure the principles of normal distribution during the correlation analysis stage and maintain the focus of the study, 40 people without depressive symptoms (scores between 0-9 points) were excluded, and the final statistical analyses were conducted on a group of 115 people (N=75). All participants accepted an informed consent form, and confidentiality and ethical principles were strictly observed during the research process.

#### 3.3. INSTRUMENTS

Several methods were used in the study. The following psychodiagnostic methods with validity and reliability indicators were used to measure the variables in the study:

1. Belov's "Temperament Formula" test: This method, based on the classical temperament theory of Hippocrates, was applied to determine the dominant temperament type of respondents and the percentage of each type in their individual profile. The test consists of a block of questions corresponding to the four main temperament types (choleric, sanguine, phlegmatic, melancholic).

2. Beck Depression Inventory (BDI): It was used to measure the severity of depression and the intensity of emotional-cognitive symptoms. This scale, consisting of 21 items, allows the students' condition to be grouped into five levels (no symptoms, mild, moderate, severe and very severe) based on the scores obtained.

### 3.4. DATA COLLECTION

The study began with an empirically derived and validated approach to the problem. Then, permission was sought from the educational institution to obtain the information through the documentary presentation required by the University administration. After agreement, the tools were applied so that the data could be analyzed for differential analysis in accordance with the proposed objectives. The empirical data obtained from the study were analyzed using the IBM SPSS Statistics 27 software package. Descriptive statistical methods (percentage, frequency indicators) were used in the analysis of the data. Spearman correlation analysis was applied to determine the relationship between temperament types and depression scores. The statistical significance level was accepted at  $p < 0.05$  and  $\alpha = 0.05$ . After processing, they were clearly presented, summarized in tables with the necessary analysis and comments.

## 4. RESULTS

As a result of descriptive statistical analysis, the overall distribution of depression levels of 115 students included in the study group was determined as follows according to the data:

1. No depressive symptoms (0-9 points): 40 people (34.8%)
2. Mild depression (10-15 points): 32 people (27.8%)
3. Moderate depression (16-19 points): 14 people (12.2%)
4. Severe depression (20-29 points): 22 people (19.1%)
5. Very severe depression (30-63 points): 7 people (6.1%)

The results of the study show that the intensity of depressive symptoms is directly proportional to the nervous system characteristics of temperament types. The quantitative distribution of depression levels by temperament types is reflected in the Table 1.

**Table 1.** Quantitative distribution of temperament types and depression levels (N=115)

Temperament Type	No symptoms	Mild	Moderate	Severe	Very Severe	Total
Choleric	8	11	1	1	1	22
Sanguine	15	9	3	12	1	40
Phlegmatic	14	8	6	4	0	32
Melancholic	3	4	4	5	5	21

Table 1 shows that the relationship between temperament types and depression levels among students is presented on the basis of quantitative indicators (N=115). The results demonstrate that temperament characteristics have a differential effect on both the prevalence and severity of depressive symptoms.

The indicators for respondents with choleric temperament indicate that low-intensity depressive states predominate. Thus, in this group, most participants either do not have depressive symptoms (n=8) or have mild symptoms (n=11). Moderate, severe, and very severe degrees were recorded in only one person. This result suggests that the characteristics of choleric temperament such as high activity, energy, and extroversion can enhance emotional adaptation.

The results for students with sanguine temperament are more heterogeneous. In this group, along with "no symptoms" (n=15) and mild (n=9) cases, the relatively high level of severe depression (n=12) is noteworthy. The presence of moderate (n=3) and very severe (n=1) cases indicates that sanguine people, despite their generally positive emotional background, may show emotional instability in certain situations.

A more balanced and stable distribution is observed among respondents with phlegmatic temperament. Asymptomatic (n=14) and mild (n=8) levels prevail, while moderate (n=6) and severe (n=4) cases are relatively low. The absence of very severe depression confirms the characteristics of this temperament type such as emotional stability and stress resistance.

Among participants with melancholic temperament, higher severity levels of depression prevail. Asymptomatic cases are at a minimum level (n=3), while the high level of severe (n=5) and very severe (n=5) depression indicators

indicates that this temperament type is characterized by emotional sensitivity, introversion, and a tendency to negative affective experiences. In general, a comparative analysis shows that phlegmatic and partially choleric temperaments are characterized by a lower risk profile. Melancholic temperament acts as a high-risk group in terms of severe and very severe forms of depression. Sanguine temperament, on the other hand, demonstrates an ambivalent profile and is represented in both low and high levels of depression. Thus, the results obtained confirm that temperament characteristics are one of the important psychological determinants in the formation of depressive states and highlight the importance of taking individual temperament characteristics into account in planning preventive-psychological interventions.

Table 2 shows that there is a high risk relationship between melancholic temperament and depression. The study proves that students with melancholic temperament are the group most prone to depression (85.7%). In particular, the fact that the vast majority of "Very Severe" depression cases (71.4%) belong to this type is explained by the low tolerance of the weak nervous system to external stress factors. These students are more prone to directing emotional tension inward (introversion) and interpreting events pessimistically.

**Table 2.** Distribution of temperament types within levels of depression (N=75)

Depression Level	Choleric	Sanguine	Phlegmatic	Melancholic
Mild (32 people)	34.4%	28.1%	25.0%	12.5%
Moderate (14 people)	7.1%	21.4%	42.9%	28.6%
Severe (22 people)	4.5%	54.5%	18.2%	22.7%
Very Severe (7 people)	14.3%	14.3%	0%	71.4%

Table 2 shows that sanguine people can act as an indicator of unpredictability. The depressive tendency in students with sanguine temperament is 62.5%. Interestingly, the indicator of severe depression in this type is the highest in number (12 people). More than half of the students suffering from severe depression (54.5%) fall into the share of sanguine people.

This may be due to the fact that the social activity of sanguine people sometimes masks internal emotional tension, and the academic load overexerts their balanced nervous system. The fact that the study was conducted close to the exam session justifies this result.

The study showed that phlegmatic emotional stability is also manifested in depression. Depression in phlegmatic people is more likely to be mild and moderate, and "Very severe" depression is not common at all (0%). They are the group with the lowest tendency to depression, with 56.3%. This is a clear indicator of emotional stability due to the strong and balanced nervous system.

Our study showed that the active defense mechanism of choleric people clearly manifests itself in depression. Although depressive symptoms are detected in 63.6% of choleric people, exactly half of them (50%) are in a mild (subdepressive) state. The fact that their strong and unbalanced nervous system creates conditions for immediate outburst of emotions (extroversion). This active reaction mechanism acts as a key factor preventing negative energy from accumulating internally and turning into a deep depressive collapse.

A statistical analysis was conducted to determine the relationship between temperament indicators and the level of depression. Since the normal distribution law was not ensured between the research variables, Spearman's rho correlation analysis (a non-parametric method) was used. The results of the statistical analysis showed that there was a statistically significant, positive relationship between temperament and the level of depression: ( $r = 0.293^*$ ;  $p = 0.011$ ;  $N = 75$ ). The fact that the p value obtained was less than 0.05 ( $p < 0.05$ ) confirms that this relationship is not random and is statistically significant.

The determined correlation coefficient shows that the observed increase in temperament characteristics (especially the degree of weakness and imbalance of the nervous system) is accompanied by a parallel increase in the intensity of depressive symptoms.

The weak-moderate level of correlation suggests that it is more appropriate to evaluate temperament not as the sole and direct cause of depression, but rather as a risk factor or moderator that creates an individual predisposition (Table 3).

**Table 3.** Indicators of the relationship between the level of depression and temperament

Correlation Test	Variable	Statistic	Depression	Temperament
Spearman's rho	Depression	Correlation coefficient	1	.293*
		Sig. (2-tailed)	—	0.011
		N	75	75
	Temperament	Correlation coefficient	.293*	1
		Sig. (2-tailed)	—	0.011
		N	75	75

Note. Correlation is significant at the 0.05 level (2-tailed).

This result confirms that temperament plays an important role in the formation of depressive symptoms in connection

with the characteristics of the nervous system, emotional reactivity and individual response mechanisms to stress. At the same time, the obtained indicators emphasize that the relationship between temperament and depression is complex, and this relationship should be explained not only in terms of biological factors, but also in terms of the socio-psychological environment.

## 5. DISCUSSION AND CONCLUSION

The results of our study are consistent with a number of studies. Although the methodological approach here is different, the results are similar in content. Thus, according to studies that tested two models to explain the relationship between anxiety, depression, hopelessness and affective temperaments, in addition to anxiety, depression and hopelessness, temperament traits such as dysthymic-cyclothymic-anxious and irritable temperament appear as observed variables [18]. The results showed that the six observed variables can be divided into two latent factors: the first is unstable cyclothymic temperament, which represents the relationship between affective temperaments and depression, and the second is a factor called demoralization, which includes anxiety (state/trait) and hopelessness, but not depression [18, 19]. Studies have shown that the unstable cyclothymic temperament factor includes irritable temperament (52%) and Dysthymic/Cyclothymic/Anxious temperament (75%), as well as a depression component (76%), which is associated with individuals' inability to experience positive emotions, feelings of fatigue and dissatisfaction, sensory reactivity that includes slowing down, and holding generally critical thoughts about themselves [18, 19].

Depression was associated with feelings of vulnerability and was structurally characterized by specific temperamental features that negatively affect both personal mood and interpersonal relationships. Thus, the unstable cyclothymic temperament factor encompassed a psychological state in which individuals perceive a state of imbalance, characterized by generally pessimistic and self-critical cognitions. However, this study had some limitations, such as the cross-sectional study design, while longitudinal studies are more informative; Moreover, the limited sample size (which makes it impossible to examine gender differences in these associations) and the use of a non-clinical population prevent the generalization of the results.

An experimental psychological study of the influence of individual psychological characteristics on the development of depression in students showed that temperament types also play a major role in the development of depression. Thus, the type with a weak nervous system (melancholic) is more prone to depression. Melancholic people, who are immersed in their own psychological world, suppress their feelings and avoid communication, do not share their problems with others, and most importantly, have a pessimistic attitude to events and focus on the negative, become withdrawn, which can ultimately lead to the development of depression. However, the phlegmatic temperament type is prone to depression due to the type of nervous system (strong-balanced). Choleric temperament type (strongly unbalanced) is the temperament type with the lowest frequency of depression, according to the results of the study, which is due to their openness to communication and their ability to openly experience and express their emotions, and to direct their emotions to others in an aggressive manner in specific situations, as well as their determination and tolerance. Thus, people with choleric temperament type differ from other temperament types in their approach to events, which indicates that they have a low level of depression.

Based on the results of the study, we can note that there is a certain dependence between temperament types and depression. Thus, the presence of psycho-emotional disorders in students with an unbalanced type of nervous system leads to a decrease in the quality of life and adaptation to excessive workload, which can subsequently lead to the development of pathological conditions and a decrease in the quality of work performed.

We believe that identifying temperamental characteristics and psycho-emotional disorders in future students will help them develop and make choices as more effective specialists in a particular specialty.

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