

Temperament and psychological and social functioning of children with disorders belonging to autism spectrum disorder

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Abstract

Introduction: In contemporary psychological research, increasing emphasis has been placed on temperamental differences as a salient determinant of psychosocial development in children with autism spectrum disorders. Certain temperamental constellations are considered to foster more adaptive social and emotional functioning, whereas others may confer heightened susceptibility to difficulties within these domains.

Aim of the research: The aim of the work was to analyze the correlations between temperament traits and psychosocial functioning of children with autism spectrum disorder (ASD). Moreover, an attempt was made to distinguish groups of children with ASD with specific types of temperament.

Material and methods: The study included 58 women raising children diagnosed with autism spectrum disorder (according to DSM-5). The following research methods were used in the work: a self-designed questionnaire, the EAS-D/C version of the Temperament Questionnaire by Buss and Plomin, a set of questionnaires for the Autism Spectrum Rating Scales (ASRS) by Goldstein and Naglieri and the Strengths and Difficulties Questionnaire (SDQ) by Goodman.

Results and conclusions: The results of statistical analyses indicate the presence of significant correlations between temperament traits and difficulties in psychosocial functioning and symptoms of autism spectrum disorder in children. Based on the cluster analysis in the group of children with ASD, two subgroups differing in temperament types were distinguished, namely individuals with an active and passive type of temperament. Children with ASD with an active temperament type are characterized by high strength and speed of motor reactions, high level of sociability and low shyness. Children with ASD with a passive temperament type are characterized by low activity and sociability, and increased shyness.

Introduction

Autism spectrum disorder is a neurodevelopmental disorder. Children with autism spectrum disorder (ASD) show deficits in social communication, difficulties in establishing and sustaining interpersonal relationships, sharing emotions and interests. They are characterized by repetitive, stereotyped patterns of behavior [1–5] and difficulties with accepting changes in familiar environment [1, 6, 7].

Gerhant *et al.* [8], and Williams and Gray [9] emphasize that the causes of autism spectrum disorder are not fully understood. The determinants of autism spectrum disorder are multifactorial, with a combination of primarily genetic and environmental factors [8, 10–16]. Tick *et al.* [16] and Omelańczuk and Pisula [5, 17, 18] point to the presence of significant correlation between the symptoms of autism spectrum disorder and temperament, which is a genetically determined personality factor.

Pisula *et al.* [18] studied the correlation between autism symptoms and temperament traits in children, using the Temperament Questionnaire by Buss and Plomin. Buss and Plomin [19] define temperament as a set of genetically determined personality traits that are revealed early in an individual's life. Buss and Plomin [19] distinguished three basic features defining the structure of temperament: emotionality, activity and sociability. The authors describe “emotionality” as a tendency to easily react with strong agitation, emotions and expressing negative emotions. “Activity” is associated with motor skills and locomotion, and “sociability” is associated with extraversion and a tendency to prefer the company of other people [19]. Pisula *et al.* [18] found positive correlation between autistic symptoms and emotional reactivity, fear and anger, and negative correlation between autistic symptoms and activity, endurance, and sociability. People with high scores in the intensity of autism symptoms showed higher emotional reactivity, anxiety and an-

ger, and lower stamina, persistence, and sociability compared to the level of these features in the general population. Pijl *et al.* [20], Omelańczuk and Pisula [5, 17] believe that temperamental factors can be taken into account as predictors of symptoms of autism spectrum disorder. Similarly, Frick [21] and Macari *et al.* [22] imply that temperament dimensions, such as negative affectivity or low self-control may be predictors of developmental disorders and may determine the intensity or persistence of autism spectrum symptoms.

According to other authors [23–25], temperament traits such as emotionality, activity and sociability are also significantly associated with the symptoms of autism spectrum disorder. Jahromi *et al.* [4], Hirschler-Guttenberg *et al.* [26] and Mazefsky *et al.* [3] described difficulties in regulating emotions in children with ASD, mainly anger and fear. Morris *et al.* [27] and Rydell *et al.* [28] showed that difficulties with the regulation of anger and fear in children influence the emergence of externalizing behaviors (increased aggression, impulsiveness, low self-control) and internalizing behaviors (increased anxiety, depression, withdrawal). These behaviors are a predictor of low acceptance by peers and difficulties in social relations.

Based on the results of the Danish version of the Cloninger Temperament and Character Inventory, Sizoo *et al.* [29] point out that people with ASD have a high level of harm avoidance and a low level of self-directedness, novelty seeking and reward dependence. Vuijk *et al.* [30, 31] analyzed the results of research describing temperament traits in people with disorders belonging to autism spectrum. They found that ASD symptoms are significantly related to temperament traits such as introversion, rigidity of behavior, low level of novelty seeking, reward dependence, self-directedness and cooperativeness, and high level of harm avoidance. Vuijk *et al.* [31] also found positive correlations between the severity of ASD symptoms and neuroticism, and negative correlations between ASD symptoms and extraversion, openness to experience, agreeableness and conscientiousness. Similarly, Austin *et al.* [32] showed that people with severe symptoms of autism present the personality profile with prevailing high neuroticism, low extraversion and low agreeableness. High neuroticism is associated with attention and communication difficulties. A low level of extraversion and agreeableness are associated with difficulties in attention span, communication, and social skills. The author also points to significant negative correlation between openness to new experience and difficulties in communication, imagination, and social skills [32].

Kunihira *et al.* [33] described the occurrence of significant correlation between the severity of autism symptoms and three dimensions of temperament. Negative correlations occurred between autistic symptoms and novelty seeking and reward dependence, and positive correlations between autistic traits and

harm avoidance, defined as a genetically determined predisposition to intense reactions to aversive stimuli. According to Del Rosario *et al.* [34], the tendency to respond to a new stimulus in the form of activity or withdrawal may be a potential early sign of autism spectrum disorder. Kerekes *et al.* [35] found that children with ASD score high on harm avoidance and low on reward dependence. In addition, they are characterized by an increased level of worry, pessimism, and fear.

Jósewicz [36] sought the relationship between the symptoms of autism spectrum disorder, and temperament, and personality. The author points out that high intensity of autistic features is associated with low endurance, activity, sensory sensitivity, and high emotional reactivity. Based on the regression analysis, she showed that temperament traits explained 43% of the variability in autistic traits in the students she surveyed. Activity and sensory sensitivity were the best predictors of autism spectrum traits. Autistic traits correlated positively with neuroticism and negatively with extraversion, openness to experience, and agreeableness. The conducted cluster analysis showed that people with a low intensity of autism spectrum symptoms were active and resilient, and showed low emotional reactivity. They were also characterized by extraversion, openness to experience, agreeableness, and a low level of neuroticism. People with increased ASD symptoms were characterized by low endurance, low emotional stability, low extraversion, and lower openness to experience [36].

The following authors [37–42] compared the temperament profile of children with ASD and children developing properly. They believe that children with ASD are characterized by higher negative affect, lower emotions regulation, lower novelty and reward seeking, higher shyness and introversion, higher social withdrawal, lower level of attention span and divisibility, lower level of reaction inhibition. Clifford *et al.* [43] describe lower positive affect, higher negative affect, and lower level of regulation in children with ASD.

Lee *et al.* [44] point to the differentiation of the temperament profile in people diagnosed with ASD.

Boström *et al.* [45] identified three temperament profiles of children with disabilities: active, passive/withdrawn, and disruptive. They showed that children with autism spectrum disorder exhibit a passive/withdrawn profile, characterized by low levels of activity and sociability. Based on the cluster analysis, Lee *et al.* [44] distinguished two types of temperament in children with ASD: the reactive type and the balanced type. Children showing the characteristics of the balanced temperament were characterized by increased regulatory and reactivity control, higher activity control, attention span, control of emotions and behavior. On the other hand, children with a reactive temperament showed a lower level of regulation of emotions and behavior, a higher level of reactivity, increased readiness to react impulsively, anger,

frustration, and a sense of discomfort. Children with a reactive temperament more often reacted with fear, anxiety, sadness, and anger. Children with the balanced profile achieved a significantly higher level of adaptive functioning compared to children with the reactive temperament profile.

Garon *et al.* [42] conducted a study on temperament profiles and their association with autistic symptoms in children. Children diagnosed with ASD differed in the temperament profile from their non ASD siblings and the control group. The temperament of children with ASD was characterized by lower positive affect and higher negative affect, as well as difficulties in controlling attention and behavior. This feature was called emotion regulation effort. The aforementioned temperament was also characterized by less sensitivity to social stimuli.

Currently, research focuses not only on identifying emotional, social and behavioral problems in people with ASD, but also on assessing personality and temperament traits, as well as on analyzing the correlations between these variables [46]. The diagnosis of temperament traits can help choose therapeutic interventions that are the most beneficial for the child. Research into temperament may help explain why some children with ASD develop more and some less severe emotional, social or behavioral problems. Temperament provides information about an individual's behavioural style [47]. Understanding its variability in people with ASD can help caregivers and teachers anticipate and manage aspects of the social and physical environment that may not match the child's individual needs.

The results presented above justify the need for further research on the correlation between temperament traits in children and their psychological and social functioning, as well as the build-up of symptoms of autism spectrum disorder.

Aim of the research

The aim of the work was to analyze the correlation between temperament traits and psychosocial functioning of children with a medical diagnosis of disorders belonging to autism spectrum (according to DSM-5). Moreover, an attempt was made to distinguish groups of children with ASD which differ in types of temperament.

Material and methods

The study involved 58 women raising children diagnosed with autism spectrum disorder. Children with the listed disorders belonging to the autism spectrum (according to DSM-5) are from 5 to 16 years old. The average age of the surveyed mothers was 38 years. Half (50%; $n = 29$) of the mothers live in the countryside and half (50%; $n = 29$) live in the city. Vocational education was completed by 10 (17.24%) women, secondary by 15 (25.86%), and 33 (56.89%)

completed higher education. There are 26 (44.83%) professionally active women, 2 (3.45%) receiving disability pensions, 18 (31.03%) who are not working by choice, and 1 (1.72%) woman registered as unemployed. 10 (17.24%) mothers raise the child alone, and 48 (82.76%) mothers together with the child's father.

Study procedure

The study was approved by the Bioethics Committee at the Medical University of Lublin (approval no. KE-0254/3/2020). The individuals who consented to the study were provided with a set of questionnaires. They were informed that they could consult a psychologist at any time in case of questions regarding the study. The female subjects completed the questionnaires individually at the Mental Health Center, but also had the opportunity to complete them at their place of residence. Each of the subjects received material including instructions, a demographic survey and a set of the above questionnaires. The study was absolutely voluntary. The subjects had the opportunity to request psychological help if needed.

Methods

The following research methods were used in the work:

A self-constructed survey was used to collect data on the age of the studied women and their children, the educational level of the participants, their place of residence, marital status, professional activity, and the children's medical diagnoses.

The Buss and Plomin EAS-C Temperament Questionnaire in the Polish adaptation by Oniszczenko [48]. The study used the EAS-C version of the Questionnaire on whose basis the surveyed mothers determined the temperament traits of their children diagnosed with autism spectrum disorder. The questionnaire consists of 20 items. The EAS-C version of the questionnaire consists of four scales: emotionality – expressing a tendency to easily react with strong agitation, negative emotions: anxiety, fear; activity – expressed by the strength and speed of action, motor reactions, sociability – associated with extraversion and a tendency to preferring the company of other people, avoiding loneliness, and shyness – expressed through inhibition, embarrassment, a sense of tension and discomfort in the presence of strangers [19, 48].

The Set of Questionnaires for the Diagnosis of Autism Spectrum Disorders (ASRS) by S. Goldstein and J. A. Naglieri enables the identification of difficulties related to: communication skills, attention deficit, difficulties in contacts with peers and adults. The parent chooses the answer from among 5 options: 0 – never, 1 – rarely, 2 – sometimes, 3 – often, 4 – very often, which best describes the child's difficulties. In 2014, a Polish standardization study was conducted.

Internal consistency, defined by Cronbach's α coefficient, was very high; for the overall score of the version for parents it was 0.93. The coefficients for the DSM scale were also very high and ranged from 0.88 to 0.96 [49]. A version of the questionnaire for parents was used in the study.

The Strengths and Difficulties Questionnaire (SDQ) by R. Goodman is a tool used to assess the intensity of symptoms of emotional, social and behavioural difficulties in children from 3 to 16 years of age. The SDQ questionnaire consists of 5 subscales: Hyperactivity/Inattention, Emotional Symptoms, Conduct Problems, Peer Relationship Problems, Prosocial Behavior Symptoms – (PBS). In Poland, the only available standards are for the self-report version of the SDQ questionnaire for adolescents [50, 51]. In the study, a version of the questionnaire for parents was used.

Statistical analysis

The obtained scores were statistically analyzed using Statistica 10.0 PL software. Correlations between interval variables were determined by calculating the Pearson's r -correlation coefficients. Non-hierarchical cluster analysis was used to distinguish people

with different temperament traits. Cluster analysis leads to the grouping of objects based on their mathematically defined similarity. The technique used is called the k -means method. The differences between the isolated groups differing in temperament types in terms of selected variables were determined using the t -test for independent groups [52]. The value of 0.05 was considered statistically significant.

Results

In order to answer the questions whether any correlations occur between temperament traits and psychological and social functioning of children with ASD and, if so, what they are, Pearson's r -correlation coefficients were calculated between the scores on the scales of the Temperament Questionnaire in the EAS-C version and on the scales of the Strengths and Difficulties Questionnaire (SDQ) as well as on the scales of the ASRS Questionnaire (Table 1).

The correlation results indicate the occurrence of significant dependencies between the child's temperament traits:

– tendency to react to stimuli with fear, dissatisfaction and problems with attention span, low level

Table 1. Pearson's r -correlation coefficients calculated between the scores on the EAS-C and the SDQ scales and on the ASRS scales

Variables	EAS-C scales			
	Emotionality	Activity	Sociability	Shyness
SDQ scales				
Hyperactivity/Inattention	0.47***	0.26*	−0.05	−0.17
Emotional symptoms	0.47***	−0.01	−0.05	0.06
Conduct problems	0.49***	0.23	−0.04	−0.04
Peer relationship problems	0.17	−0.03	−0.34**	0.22
Prosocial behavior	−0.23	−0.07	0.18	−0.04
Total score	0.56***	0.15	−0.16	0.02
ASRS scales				
Social/Communication	0.18	−0.07	−0.43***	0.24
Unusual behavior	0.35**	0.28*	−0.10	−0.01
Self-regulation	0.41**	0.34**	0.04	−0.03
DSM	0.35**	0.18	−0.23	0.10
Peer socialization	0.27*	0.04	−0.41**	0.23
Adult socialization	0.40**	0.24	0.02	0.06
Social-emotional reciprocity	0.26*	0.04	−0.30*	0.11
Atypical language	0.23	0.22	−0.10	0.05
Stereotypes	0.27*	0.39**	0.17	−0.16
Rigidity of behavior	0.36**	0.26*	−0.07	−0.03
Sensory sensitivity	0.27*	0.12	−0.26*	0.05
Attention	0.30*	0.16	−0.06	0.06

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

of emotion control, conduct problems, intensified symptoms of autism spectrum disorders (according to DSM-5), difficulties in initiating and maintaining interpersonal interactions and intensified stereotype behaviors;

- high rate and strength of motor reactions and hyperactivity, attention span problems, impulsiveness;
- low motivation to initiate social interactions and increased difficulties to communicate and maintain social interactions, predominantly with the peers, limited ability to react emotionally in an adequate way in interactions with other people, excessive sensitivity to stimuli and intensified symptoms of autism spectrum disorders.

At the final stage of the study, the answer to the following questions was sought: whether and what types of temperament can be distinguished in a group of children with ASD. It should be emphasized that the children's temperament traits were assessed by their mothers. Based on the cluster analysis, two groups of children were distinguished, which are identified by a characteristic arrangement of the scores on the scales of the Temperament Questionnaire in the EAS-C version. The division into two subgroups is justified by statistical and substantive arguments: the size of the subgroups allows them to be compared in terms of specific variables and a clear psychological significance of the revealed temperament types (Figure 1).

Table 2 presents the results of t-Student test, which was used to compare the distinguished temperamental types of children with ASD as regards criterion variables (results in EAS-C scales) and difficulties in psychosocial functioning, assessed with SDQ and ASRS questionnaires.

The first group, with the active temperament (type 1), consists of 28 people. It is characterized by high activity and sociability, and low shyness. The second group, with a passive temperament type, consists of 30 people and is characterized by low activity and sociability, and high shyness. Both groups do not differ significantly in terms of emotionality understood as a tendency to react to stimuli easily, intensely and with anxiety.

The group with the active temperament (type 1) is characterized by significantly lower fear of strangers, intensity of motor reactions, stronger motivation to seek social contacts, and at the same time less severe difficulties in social relations and communication, compared to the group with the passive temperament (type 2).

The group with the passive temperament (type 2), compared to the group with the active temperament (type 1), is characterized by a significantly more intense tendency to react with tension, anxiety, withdrawal in social relations, lower motivation to initiate interpersonal contacts, because they evoke fear and anxiety.

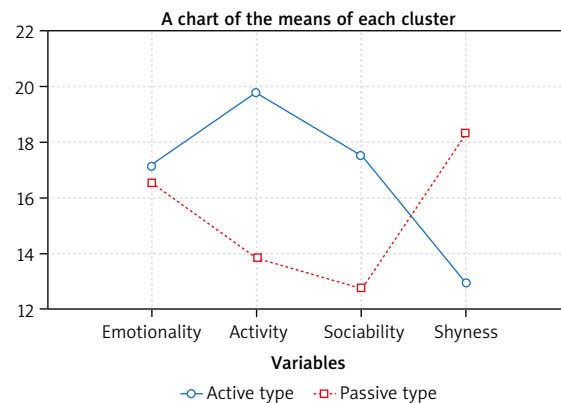


Figure 1. Distinguished groups of children with ASD with two temperament types: active and passive

Discussion

The results of the conducted statistical analyses indicate the occurrence of significant correlations between temperament traits in children with ASD, determined on the basis of the Temperament Questionnaire in the EAS-C version, and the severity of symptoms of autism spectrum disorder, assessed on the basis of the ASRS Questionnaire, and problems in psychological and social functioning, assessed on the basis of the SDQ Questionnaire.

Significant correlations were shown between increased emotionality, low threshold of reacting with anxiety and dissatisfaction in children with ASD, and increased difficulties in attention span, emotional control and behavior, as well as increased symptoms of disorders belonging to autism spectrum. Increased motor activity in children with ASD is associated with difficulties in attention, low self-regulation, and stereotyped behavior. Significant correlations were also shown between the temperament trait – avoidance of social contacts and difficulties in relations with peers, communication disorders and emotional and social exchange. A hypothesis could be formulated that a temperamentally conditioned low threshold of reacting with agitation, negative emotions to stimuli with increased motor activity and avoidance of social relationships in children with ASD will be conducive to the development and intensification of their behavioral disorders, conflicts with peers and adults. It will hinder the process of learning, attention span, control of emotional reactions, expressing negative emotions constructively, expressing them in the way adequate to the stimulus, thus leading to increased feelings of dissatisfaction, rejection, isolation and problems with verbal and non-verbal communication. In such a mechanism, the child's temperament traits may exacerbate its psychosocial functioning problems and ASD symptoms.

The described results partly correspond to the study of Pisula *et al.* [18], which report that people

Table 2. Comparison of the mean scores obtained by the distinguished groups of people with active and passive temperament types on the EAS-C scales and on the SDQ and ASRS scales

Variables	Active type		Passive type		t
	M	SD	M	SD	
EAS - C					
Emotionality	17.14	3.61	16.57	3.08	0.66
Activity	19.79	2.96	13.87	3.75	6.64***
Sociability	17.54	2.90	12.77	3.19	5.94***
Shyness	12.96	2.96	18.33	3.11	−6.72***
SDQ scales					
Hyperactivity/Inattention	6.93	2.43	6.63	2.48	0.46
Emotional symptoms	4.93	2.61	5.23	2.36	−0.47
Conduct problems	3.68	2.11	3.70	2.25	−0.04
Peer relationship problems	4.46	2.24	5.27	1.98	−1.45
Prosocial behavior	6.54	2.01	5.83	1.78	1.41
Total score	20.00	6.56	20.83	6.95	−0.47
ASRS scales					
Social/Communication	30.54	12.19	37.10	9.63	−2.28*
Unusual behavior	47.71	19.35	44.57	17.87	0.64
Self-regulation	38.14	11.71	36.33	10.53	0.62
DSM	66.54	22.72	69.67	19.26	−0.57
Peer socialization	17.46	6.86	19.30	6.06	−1.08
Adult socialization	11.93	4.88	12.33	4.10	−0.34
Social-emotional reciprocity	23.07	8.34	25.77	7.37	−1.31
Atypical language	8.36	5.91	7.27	4.62	0.79
Stereotypes	10.86	4.19	8.43	4.49	2.12
Rigidity of behavior	18.82	6.97	18.27	7.16	0.30
Sensory sensitivity	9.36	5.61	9.77	5.09	−0.29
Attention	23.75	6.49	24.37	5.88	−0.38

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

with severe autistic traits show higher emotional reactivity to stimuli, increased anxiety and anger, and lower persistence, activity and sociability, compared to the norms for the general population. Comparing the temperament of children with autism spectrum disorder with that of typically developing children, Boström *et al.* [53] found that children with ASD are less sociable and active, and more emotional and shy than children in the control group. Tick *et al.* [16] and Omelańczuk and Pisula [5, 17] point to the important role played by specific temperament traits in the genesis of difficulties in establishing and keeping social relationships by people with autism spectrum disorder. Similarly, Pisula *et al.* [18] describe a low degree of sociability in children with autism spectrum disorder. People with autism spectrum disorder have

difficulties in making peer friendships, due to which they may show more indifference, or social reserve in social interactions.

The study results additionally inform about the occurrence of significant correlations between temperament traits in children with ASD, such as high threshold for reacting with anxiety and dissatisfaction, low strength and speed of motor activity, high level of sociability, striving for social contacts, avoiding solitude, and low severity of symptoms belonging to autism spectrum. The obtained results fully correspond with the results of Jósewicz [36] who sought relationship between the symptoms of autism spectrum disorder, and temperament and personality. She showed that people with a low intensity of autism spectrum symptoms are active and resilient, show-

ing low emotional reactivity. High intensity of autistic features is associated with low resilience, activity and sensory sensitivity, and high emotional reactivity [36]. This means that people with autism spectrum disorder may have difficulties with emotional regulation and impulse control. In Jósewicz's research [36], one of the best predictors of the characteristics of people with disorders belonging to autism spectrum turned out to be the temperament trait of activity. In the study of the authors of the article, the strongest correlation coefficients were obtained between ASD traits, difficulties with attention span and behavior, and emotionality understood as a temperamentally conditioned tendency to overreact to stimuli with dissatisfaction and anxiety. Emotionality as understood by Buss and Plomin includes negative emotions, such as dissatisfaction, fear and anger. These temperament traits may be conducive to the emergence of upbringing difficulties in children with autism spectrum disorder. The obtained research results imply the need for parents to develop proper reactions, conducive to calming down the child's tendency to react with increased anxiety. A low threshold for reacting with negative affect in children may lead to easy conflict situations with parents or peers. It should be emphasized that emotionality as a temperament feature of children with ASD is genetically determined and is associated with the need for stimulation and impulsivity. The knowledge passed on to parents regarding the correlation between the symptoms of ASD and the child's temperament characteristics may contribute to a better understanding of emotional and behavioral reactions, greater acceptance of the child's excessive activity, intensified emotional reactions disproportionate to the stimulus. Pisula [54], Żmijewska and Pisula [55], Rynkiewicz and Kulik [56] emphasize the legitimacy of temperament assessment and the search for correlations between temperament traits and autistic traits in order to implement therapeutic measures early enough when the child's emotional constitution is unfavorable.

The results obtained in the work are consistent with the opinion of the authors [5, 42, 57] who believe that children with autism spectrum disorder constitute a heterogeneous group in terms of temperament types. The study identified a group of children with autism spectrum disorder exhibiting an active temperament type, characterized by high strength and speed of motor reactions, a high level of sociability, and low shyness, as well as a group with a passive/withdrawn temperament type, characterized by low activity and sociability and increased shyness. Similarly, Boström *et al.* [45] distinguished active and passive temperament profiles in children with disabilities. However, these authors found that children with ASD have a passive type of temperament. Knowledge about differences in temperament in children with ASD will allow, on the one hand, to optimize the pro-

cess of rehabilitation and therapy of children with ASD, and on the other hand, to provide adequate support and help to their parents.

Vuijk *et al.* [31] emphasize that in order to obtain a comprehensive picture of psychological functioning of people with ASD and to implement the most effective intervention and therapeutic plan, their temperament profile should be taken into account. The specificity of the distinguished groups with different types of temperament should be considered in the process of planning rehabilitation and various forms of therapy: speech therapy, pedagogy and psychology, as well as family therapy. The methods of working with people with ASD and the interventions applied to them require both parents and specialists working with the child to assess the child's temperament [37, 58, 59].

The small number of surveyed mothers constitutes a limitation of this work. Therefore, the presented research should be treated as a preliminary report. The study used the tools to measure temperament and assess the severity of autism spectrum symptoms based on the information from the mothers. Accordingly, the possibility of an inadequate assessment of the child's difficulties should be considered. Observation of parents of children with various difficulties shows that some parents do not want to see the child's problems, deny its clinical symptoms, want to have a "healthy" child, and fight back against feeling guilty for the child's problems. Other parents may exaggerate the child's difficulties because of their own psychological and financial problems. Research on temperament and its typology in children with ASD and differences in psychosocial functioning of people with different types of temperament are particularly important due to the growing number of people diagnosed with autism spectrum disorder and the importance of the results of these studies for the optimization of therapy.

Conclusions

Significant correlations were found between the child's temperament traits: increased sensitivity to stimuli causing dissatisfaction, fear, anxiety, and problems with attention span, emotions control, behavior, increased symptoms of autism spectrum disorders (according to DSM-5), difficulties in maintaining interpersonal relationships, increased stereotyped behavior and conflict.

Significant correlations occur between the temperamentally high rate and strength of motor reactions in children with ASD, and impulsiveness, conflict, stereotyped behavior and problems with attention span.

Low motivation to initiate social contacts in children with ASD is associated with difficulties in peer relationships, communication, and excessive sensitivity to stimuli.

People with autism spectrum disorder are a heterogeneous group due to temperament traits. People

with an active and a passive type of temperament were distinguished. Children with ASD with an active temperament type are characterized by a high rate and strength of motor reactions, high level of sociability and low shyness. Children with ASD with a passive temperament type are characterized by low activity and sociability, and increased shyness.

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Ethical approval

The study was approved by the Bioethics Committee at the Medical University of Lublin (approval no. KE-0254/3/2020).

Conflict of interest

The authors declare no conflict of interest.

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