Original paper

Determinants of the mental health of mothers of children with autism spectrum disorders

Justyna C. Świerczyńska[1], Beata Pawłowska[2], Izabela Chojnowska-Ćwiąkała[3], Radosław Krawczykiewicz[4]

[1]Department of Psychology Jan Kochanowski University, Kielce, Poland
[2]Department of Psychiatry and Psychiatric Rehabilitation, First Faculty of Medicine with Dentistry Division, Medical University of Lublin, Poland
[3]The Faculty of Medicine and Health Sciences, Jan Kochanowski University, Kielce, Poland
[4]PhD, Cardiology, Specialist Hospital in Nisko, Poland

Medical Studies 2026; 42 (1): 39–44
DOI: https://doi.org/10.5114/ms.2026.160426

Key words: personality, mothers, mental health, autism spectrum disorders, physical burnout.

Abstract

Introduction: The mental health of mothers of children with ASD is determined by complex interactions of individual, family and social factors, which may both increase the risk of emotional burden and serve a protective function.
Aim of the research: The aim of the work was to analyse psychological determinants of the mental health of mothers raising children diagnosed with autism spectrum disorders (ASD).
Material and methods: The study involved 58 women raising children diagnosed with autism spectrum disorders (according to DSM-5). The following research methods were used in the study: our own survey, the General Health Questionnaire GHQ-28 by D. Goldberg in the Polish adaptation of Z. Makowska and D. Merecz, the Ten-Item Personality Inventory (TIPI-PL) in the Polish adaptation by Sorokowska and *et al*., the Temperament Questionnaire EAS-D (the EAS Temperament Questionnaire by A. Buss and R. Plomin) in the Polish adaptation by W. Oniszczenko, in the version for adults, the DS-14 scale by N. Ogińska-Bulik, Z. Juczyński, and J. Denollet, the Burnout Scale authored by W. Okła and S. Steuden, the Resilience Measurement Scale by N. Ogińska-Bulik and Z. Juczyński, and the Scale of Social Support by K. Kmiecik-Baran.
Results and conclusions: Significant correlations were found between symptoms of mental health disorders in mothers of children with ASD, determined on the basis of the GHQ-28 questionnaire, and the following personality traits: neuroticism and negative emotionality. The significant predictors of mental disorder symptoms in the surveyed mothers of children diagnosed with ASD include the following: problems coping with stress, low tolerance to stress, low resilience, tendency to be socially isolated, physical burnout, and sense of lack of information support.

Introduction

The aim of research by numerous authors [1–3] was the analysis of correlation between the intensity of symptoms of autism spectrum disorders (ASD) in the child and the mental health of the parents. Bitsika and Sharpley [3] evaluated correlations between the occurrence of anxiety disorders and depressive symptoms in parents and intensification of autism spectrum disorders in the child. The results of this research inform about the correlations between communication problems in boys diagnosed with ASD and anxiety disorders and depressive symptoms in their mothers.

Alamdarloo and Maijdi [4] focused on studying the sense of helplessness in mothers of children with neurodevelopmental disorders. They demonstrated that the sense of helplessness, negative expectations concerning the future, and the loss of motivation to act were significantly more intensified in the mothers of children with ASD as compared to the mothers of children with intellectual disorders and specific learning difficulties. Selvakumar and Panicker [5] informed about the intensification of depressive and anxiety symptoms as well as lowered life quality of the mothers of children with ASD. They found that depressive symptoms occurred in 60% of mothers. In the group of the surveyed mothers 43% showed depression ranging from mild to moderate, whereas 16.5% reported severe depression. Anxiety disorders were reported by 46% of mothers, of whom 16.5% informed about severe anxiety.

Rattaz *et al*. [6] point out that mothers react to their children being diagnosed with ASD with a higher level of stress and depression as compared to their fathers. The level of stress, anxiety, and depression in mothers significantly decreased over the 3-year period from the child being diagnosed with ASD. Daniels *et al*. [7] reported that parents of autistic children were more often hospitalised due to mental disorders as compared to the parents of children from the control group. Depression and personality disorders were more often observed in mothers, but not in fathers.

Madsen [1] and Giallo *et al.* [2] emphasise that the fathers of children with disabilities, in particular those diagnosed with ASD, are more vulnerable to mental suffering as compared to the fathers of children who develop properly. Seymour *et al.* [8] demonstrated that the fathers of children with ASD experienced higher mental stress as compared to the fathers of healthy children. Giallo *et al.* [2], Johnson *et al.* [9], and Jellett *et al.* [10] draw attention to the fact that fathers may experience greater pressure related to the care of a child with ASD, which affects their mood, level of experienced stress, worry about the child's future, and his or her development.

Świerczyńska and Pawłowska [11] inform about significant dependencies between the deterioration of the mental health of the surveyed mothers: intensity of depression symptoms, fear, anxiety, insomnia, and problems with everyday functioning and intensified difficulties in the area of social relations, and communication, as well as intensified stereotype behaviours and hypersensitivity to stimuli observed in the child with ASD. Moreover, Świerczyńska and Pawłowska [11] point to significant correlations between the worse mental health of mothers and the coping strategy involving focusing on emotions and avoidance, which they often adopt. Enea and Rusu [12] inform that the risk of worse mental health and high level of stress in parents of children with ASD can be reduced by using constructive coping strategies. Moreover, Enea and Rusu [12] found that nonadaptive coping strategies including self-blaming and withdrawal from behaviours were significant predictors of increased stress level in the mother.

Aim of the research

The aim of the study was to analyse the psychological determinants of the mental health of mothers raising children diagnosed with ASD.

Material and methods

Material

The study involved 58 women raising children diagnosed with autism spectrum disorder. Children with the listed disorders belonging to the autism spectrum (acc. to DSM-5) were from 5 to 16 years old and were patients of the Mental Health Centre in Kielce. The diagnosis of autism spectrum disorders in children was made by a specialist in child and adolescent psychiatry. The average age of the surveyed mothers was 38 years. 29 (50%) mothers lived in the countryside and 29 (50%) in the city. Vocational education was completed by 10 (17.24) women, secondary education by 15 (25.86%), and higher education by 33 (56.89%). The subjects came from various locations in the Świętokrzyskie province. Those who first gave their consent to the study were given a set of questionnaires. The subjects completed these questionnaires individually, as a rule at the clinic, but it was also possible to complete them at their place of residence. Each of the subjects received material including instructions, a demographic survey, and appropriate questionnaires. The studies were individual in nature, conducted once, and the time to complete the questionnaires was unlimited.

Methods

The following research methods were used in the work: The General Health Questionnaire GHQ-28 by D. Goldberg in the Polish adaptation of Z. Makowska and D. Merecz [13], TIPI-PL – Polish adaptation of the Ten-Item Personality Inventory by A. Sorokowska *et al.* [14], The EAS-D Temperament Questionnaire by A. Buss and R. Plomin, in the Polish adaptation by W. Oniszczenko [15], The DS-14 scale by N. Ogińska-Bulik, Z. Juczyński and J. Denolllet [16], The Burnout Scale by W. Okła and S. Steuden [17], The Resilience Measuring Scale by N. Ogińska-Bulik and Z. Juczyński [16], and The Social Support Scale by K. Kmiecik- Baran [18].

Our own survey allowed of the collection of data on the following: the age of the studied women and their children, the level of education of the study subjects, their place of residence, marital status, and professional activity, and the children's medical diagnosis.

Results

The first stage of analyses involved calculating the *r*-Pearson correlation coefficients between the results obtained by the surveyed women in the scales of the GHQ-28 and the results of the TIPI-PL, the EAS-D, the DS-14, the Burnout Scale, the SPP-25, and the Social Support Scale (Table 1).

The obtained correlation results inform us about significant statistical dependencies between the following: intensified depressive symptoms, intensified anxiety and insomnia, being convinced of having an illness, problems with everyday functioning and sense of burn-out, low mental resilience and sense of insufficient social support, negative emotionality, and low emotional stability in the mothers of children with ASD.

In the next stage of study, to extract variables that were the best predictors of mental health of the surveyed women, measured by GHQ-28 (dependent variable), forward stepwise linear regression was applied. It involved calculating successively the regression equations for the dependent variable (overall result for GHQ-28), with the following independent variables: personality traits included in the Personality Inventory TIPL-PL, temperamental traits included in the Temperament Questionnaire EAS-D, traits identified in the DS-14 Scale, burnout indicators identified in the Burnout Scale, resilience indicators identified

Table 1. Correlation coefficients

Variables	GHQ-28				
	Somatic symptoms	**Anxiety and insomnia**	**Functioning disorders**	**Depressive symptoms**	**General health condition**
TIPI Inventory Scales					
Extraversion	–0.05	–0.02	–0.14	–0.13	–0.09
Agreeability	0.26	0.16	0.09	0.06	0.18
Conscientiousness	0.02	0.11	0.06	0.14	0.09
Emotional stability	–0.40**	–0.33**	–0.41**	–0.13	–0.40**
Openness to experience	0.05	–0.04	–0.06	–0.13	–0.04
EAS -D Scales					
Activity	–0.03	–0.11	0.00	0.19	–0.02
Sociability	–0.23	–0.16	–0.12	–0.05	–0.18
Distress	0.34**	0.29*	0.34**	0.22	0.36**
Fear	0.23	0.20	0.20	0.08	0.23
Anger	0.25	0.14	0.24	0.26*	0.25
DS-14 Scales					
Negative emotionality	0.28*	0.24	0.40**	0.10	0.32*
Social inhibition	0.34**	0.20	0.33**	0.06	0.30*
The Burn-out Scale					
Lowered emotional control	0.50***	0.46***	0.54***	0.47***	0.59***
Loss of subjective involvement	0.37**	0.37**	0.37**	0.31*	0.43***
Lowered action efficacy	0.47***	0.44***	0.55***	0.48***	0.57***
Narrowing of social interactions	0.34**	0.35**	0.33**	0.38**	0.41***
Physical tiredness	0.58***	0.55***	0.49***	0.34**	0.61***
Overall result	–0.61***	–0.58***	–0.61***	–0.35**	–0.66***
SPP-25 Scale					
Perseverance and determination in action	–0.10	–0.10	–0.21	–0.23	–0.18
Openness to new experience and sense of humour	–0.23	–0.23	–0.31*	–0.57***	–0.36**
Personal competences and tolerance to negative emotions	–0.24	–0.22	–0.34**	–0.33**	–0.33**
Tolerance to failures and treating life as challenge	–0.24	–0.28*	–0.34**	–0.38**	–0.35**
Optimistic approach to life and ability to mobilise in difficult situations	–0.11	–0.16	–0.26	–0.23	–0.21
Overall result	–0.28*	–0.31**	–0.38***	–0.36**	–0.38***
Social Support Scale					
Emotional support	–0.29*	–0.12	–0.17	–0.31*	–0.26
Evaluative support	–0.17	–0.11	–0.19	–0.32*	–0.21
Instrumental support	–0.21	–0.30*	–0.25	–0.33**	–0.31*
Information support	–0.43***	–0.52***	–0.49***	–0.53***	–0.58***
Overall result	–0.33**	–0.32*	–0.33**	–0.45***	–0.41**

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

Table 2. Results of stepwise linear regression for the dependent variable – mental health condition of the surveyed mothers

Independent variables	*R*	R^2	*F*	β	*B*	*t*
TIPI Scales						
Neuroticism	0.40	0.16	10.80**	0.40	0.97	3.29**
EAS -D Scales						
Distress	0.36	0.13	8.55**	0.36	0.70	2.92**
DS-14 Scales						
Negative emotionality	0.32	0.10	6.41**	0.32	0.35	2.53**
Burnout Scale						
Physical tiredness	0.66	0.43	51.65***	0.42	3.20	3.35***
Lowered emotional control	0.70	0.49	7.05**	0.33	2.41	2.65**
SPP-25 Scale						
Openness to new experience	0.42	0.18	14.52***	–0.42	–1.05	–3.81***
Social Support Scale						
Information support	0.52	0.27	25.53***	–0.52	–0.98	–5.05***

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

by the Resilience Measuring Scale (SPP-25), and type of social support described in the Social Support Scale. The results of individual regression equations are presented in Table 2.

The results of the regression analysis show that the variables which are the best predictors of mental health disorder symptoms of the surveyed mothers include the following: neuroticism, tendency to react with distress, negative emotionality, sense of physical tiredness and low emotional control, lack of openness to new experience, and sense of lack of information support. The abovementioned psychological values are explained by the following: neuroticism – 16%, tendency to react with distress – 13%, negative emotionality – 10%, sense of physical tiredness – 43%, lack of openness to new experience – 18%, and lack of information support – 27% of the mental health variance of mothers of children with ASD measured by GHQ-28.

Discussion

The results of the performed statistical analyses inform about the risk factors of mental health disorders measured by the GHQ-28 in women raising children with ASD. It was demonstrated that personality traits such as low emotional stability, neuroticism, tendency to react with negative emotions and problems with coping with stress, tendency to be socially isolated, low mental resilience, combined with intense exhaustion, mainly physical, are crucial predictors of mental health disorder symptoms in mothers raising children with ASD. It should be stressed that a sense of burnout (cumulatively: physical tiredness and low emotional control) and a sense of insufficient information support are the variables that explain the greatest percentage of the variances of the mental health condition in the surveyed mothers.

The research provided additional information pointing to psychological factors that can predispose the surveyed mothers of children with ASD to react with the following symptoms: depressive symptoms, anxiety, fear, insomnia, difficulties in everyday functioning, sense of lack of competence, and conviction of having a medical disease.

The above findings of the study correspond to the conclusions of other authors who have dealt with mental health problems of parents raining children with ASD. In their opinion, the problems to adapt to a difficult situation and the lack of mental resilience of this group of parents are connected with (frequently reported by them) depressive disorders [19–22], worse mental wellbeing [23], and low life-satisfaction [20, 21]. Similarly, Halstead *et al.* [24] are of the opinion that adaptation problems of mothers of children with ASD are connected with their worse state of mind, intensified depressive and anxiety symptoms, as well as intensified sense of loneliness. Significant correlations between adaptation skills and mental health indicators in the parents of children with ASD were also described by Bekhet *et al.* [25], who, like Kuhn and Carter [23], are of the opinion that the lack of self-efficacy is combined with intensified depressive symptoms and sense of guilt in the mothers of autistic children. Bekhet *et al.* [25] and Benson [26] name resilience to difficult situations as a personality trait that protects against the occurrence of symptoms of mental health disorders. In the opinion of Cohrs and Leslie [27],

depressive symptoms experienced by the mothers of children with ASD are combined with a loss of energy and motivation to act, and a sense of excessive tension and social isolation.

The findings of our own research, indicating the lack of sense of social support as a significant risk factor of the occurrence of mental health disorders in the mothers of children with ASD, correspond to the opinion presented by other authors. Naheed *et al.* [28] and Halstead *et al.* [24] draw attention to the fact that support provided to the parents can improve the quality of their lives, strengthen their sense of competence, agency, and self-esteem, and can help them discern the results of their work with the child and protect them from discouragement, resignation, depression, or other psychopathological symptoms. A lack of social support adequate to the situation is, in the opinion of Pisula [29], the reason for the occurrence of burnout syndrome in the parents of autistic children. Physical burnout, which involves primarily a sense of extreme physical exhaustion, turned out to be a significant psychological factor, providing an explanation of 43% of mental health variances in the surveyed mothers. Mikolajczak and Roskam [30], Le Vigouroux *et al.* [31], and Le Vigouroux and Scola [32] claim that one of the most important risk factors of physical burnout in parents is the emotional instability (i.e. neuroticism) of mothers. According to the above authors, parents lacking emotional stability due to impaired emotion and impulse control will react to life occurrences with greater intensity. Specific traits of children with ASD require from their parents greater emotional control and involvement, which can also add to a greater burnout risk. It is the personality traits of parents, in particular emotional stability, conscientiousness, and agreeability, that decide about the education strategies used by them, which affect the personality development of children and the relationship quality between the parents and children [33].

It should be stressed that personality predictors of mental health disorders in the mothers of children with ASD such as neuroticism, low emotional control, tendency to react with negative emotions, tendency to withdraw from social relations, identified in the study, as was demonstrated in the former research by Świerczyńska *et al.* [34, 35], are conducive to the use of emotion-oriented style or avoidance in stressful situations. The abovementioned stress coping styles are significantly connected with intensified depressive symptoms, anxiety, insomnia, and difficulties in everyday functioning in the group of the surveyed women [11].

The findings of the study point to risk factors of the development of mental health disorders of the surveyed group of mothers of children with ASD and, at the same time, inform about the protective factors that shield individuals from the development of them. The protective factors of the development of depressive symptoms, distress, anxiety, insomnia, and difficulties in everyday functioning include emotional stability, positive emotionality, sense of social support, and ability to use them, which adds to the prevention of tiredness and burnout syndrome; they also include mental resilience and openness to new experiences.

Conclusions

The significant predictors of symptoms of mental health disorders in the surveyed mothers of children with ASD include the following: neuroticism, problems coping with stress, distress, low stress tolerance, low mental resilience, tendency to be socially isolated, sense of physical burnout and sense of lack of information support.

Funding

This research was partially funded by Jan Kochanowski University in Kielce, grant no. SUPB.RN .25.071.

Ethical approval

The study was approved by the Bioethics Committee at the Medical University in Lublin, No. KE-0254/3/2020.

Conflict of interest

The authors declare no conflict of interest.

References

1. Madsen S. Men's mental health: fatherhood and psychotherapy. J Men's Stud. 2009; 17(1): 15-30.
2. Giallo R, Roberts R, Emerson E, Wood C, Gavidia-Payne S. The emotional and behavioural functioning of siblings of children with special health care needs across childhood. Res Dev Disabil. 2014; 35(4): 814-825.
3. Bitsika V, Sharpley CF. The Association between autism spectrum disorder symptoms in high-functioning male adolescents and their mothers' anxiety and depression. J Dev Phys Disabil. 2017; 29: 461-473.
4. Alamdarloo GH, Majidi F. Feelings of hopelessness in mothers of children with neurodevelopmental disorders. Int J Dev Disabil. 2022; 68: 485-494.
5. Selvakumar N, Panicker AS. Stress and coping styles in mothers of children with autism spectrum disorder. Indian J Psychol Med. 2020; 42(3): 225-232.
6. Rattaz C, Loubersac J, Michelon C, Picot MC, Baghdadli A; ELENA study group. Changes in mothers' and fathers stress level, mental health and coping strategies during the 3 years following ASD diagnosis. Res Dev Disabil ELENA study group. 2023; 137: 104497.
7. Daniels JL, Forssen U, Hultman CM, Cnattingius S, Savitz DA, Feychting M, Sparen P. Parental psychiatric disorders associated with autism spectrum disorders in the offspring. Pediatrics. 2008; 121(5): e1357-e1362.
8. Seymour M, Giallo RW, Wood CE. The psychological and physical health of fathers of children with Autism Spectrum Disorder compared to fathers of children with

long-term disabilities and fathers of children without disabilities. Res Dev Disabil. 2017; 69: 8-17.
9. Johnson N, Freenn M, Feetham S, Simpson P. Autism spectrum disorder: parenting stress, family functioning and health-related quality of life. Fam Syst Health. 2011; 29(3): 232-252.
10. Jellett R, Wood C, Giallo R, Seymour M. Family functioning and behaviour problems in children with an Autism Spectrum Disorder: the mediating role of parental mental health. Clin Psychol. 2015; 19(1): 39-48.
11. Świerczyńska J, Pawłowska B. Mental health symptoms in mothers of children with autism spectrum disorder and its relation to maternal coping styles, sense of coherence, and assessment of the child's emotional, social, and behavioural functioning. Wych Rodz. 2021; XXV (2): 239-255.
12. Enea V, Rusu DM. Raising a child with Autism Spectrum Disorder: a systematic review of the literature investigating parenting stress. J Ment Health Res Intellect Disabil. 2020; 13: 283-321.
13. Makowska Z, Merecz D. Polska adaptacja kwestionariuszy ogólnego stanu zdrowia Davida Goldberga: GHQ-12 i GHQ-28. In: Dudek B (ed.) Ocena zdrowia psychicznego na podstawie badań kwestionariuszami Davida Goldberga. Podręcznik dla użytkowników kwestionariuszy GHQ-12 GHQ-28. Instytut Medycyny Pracy. Łódź, 2001; 191-264.
14. Sorokowska A, Słowińska A, Zbieg A, Sorokowski P. Polska adaptacja testu Ten Item Personality. Inventory (TIPI)- TIPI-PL- wersja standardowa i internetowa. Wrocław, 2014.
15. Oniszczenko W. Kwestionariusz Temperamentu EAS AH. Bussa i R. Plomina. Wersje dla dorosłych i dla dzieci. Adaptacja polska. Pracownia Testów Psychologicznych. Warszawa 1997.
16. Ogińska-Bulik N, Juczyński Z. Skala pomiaru prężności – SPP- 25. Now Psych. 2008; 3: 39-56.
17. Steuden S, Okła W. Tymczasowy podręcznik do Skali Wypalenia Sił – SWS. Wydanie eksperymentalne. Zakład Psychologii Klinicznej KUL, Lublin 1998.
18. Kmiecik-Baran K. Skala Wsparcia Społecznego: teoria i właściwości psychometryczne. Przeg Psych. 1995; 38: 201-214.
19. Carter I. Positive and negative experiences of parents involved in online self-help groups for autism. J Dev Disabil. 2009; 15(1): 44-52.
20. Ekas NV, Lickenbrock DM, Whitman TL. Optimism, social support, and well-being in mothers of children with autism spectrum disorder. J Autism Dev Disord. 2010; 40(10): 1274-1284.
21. Ekas NV, Pruitt MM, McKay E. Hope, social relations, and depressive symptoms in mothers of children with autism spectrum disorder. Res Autism Spectrum Disord. 2016; 29: 8-18.
22. Siman-Tov A, Kaniel S. Stress and personal resource as predictors of the adjustment of parents to autistic children: a multivariate model. J Autism Dev Disord. 2011; 41(7): 879-890.
23. Kuhn JC, Carter AS. Maternal self-efficacy and associated parenting cognitions among mothers of children with autism. Am J Orthopsychiatry. 2006; 76(4): 564-575.
24. Halstead E, Ekas N, Hastings RP, Griffith GM. Associations between resilience and the well-being of mothers of children with Autism Spectrum Disorder and other developmental disabilities. J Autism Dev Disord. 2018; 48(4): 1108-1121.
25. Bekhet AK, Johnson NL, Zauszniewski JA. Resilience in family members of persons with autism spectrum disorder: a review of the literature. Issues Ment Health Nurs. 2012; 33(10): 650-656.
26. Benson PR. Coping, distress, and well-being in mothers of children with autism. Res Autism Spectrum Disord. 2010; 4(2): 217-228.
27. Cohrs AC, Leslie LD. Depression in parents of children diagnosed with autism spectrum disorder: a claims-based analysis. Autism Dev Discord. 2017; 47(5): 1416-1422.
28. Naheed A, Islam MS, Hossain SW, Ahmed HU, Jalal Uddin MM, Tofail F, Hamadani JD, Enayet Hussain AHM, Munir K. Burden of major depressive disorder and quality of life among mothers of children with autism spectrum disorder in urban Bangladesh. Autism Res. 2019; 13: 284-297.
29. Pisula E. Zespół wypalania się sił u rodziców dzieci autystycznych. Now Pedag. 1994; 3: 83-89.
30. Mikolajczak M, Roskam I. A theoretical and clinical framework for parental burnout: the balance between risks and resources (BR2). Front Psychol. 2018; 9: 886.
31. Le Vigouroux S, Scola C, Raes ME, Mikolajczyk M, Roskam I. The big five personality traits and parental burnout: protective and risk factors. Pers Indiv Differ. 2017; 119: 216-219.
32. Le Vigouroux S, Scola C. Differences in parental burnout: influence of demographic factors and personality of parents and children. Front Psychol. 2018; 9: 887.
33. Denissen JJA, Luhmann M, Chung JM, Bleidorn W. Transactions between life events and personality traits across the adult lifespan. J Pers Soc Psychol. 2019; 116(4): 612-633.
34. Świerczyńska J, Pawłowska B, Chojnowska-Ćwiąkała I, Latała A. Typy osobowości i temperamentu a style radzenia sobie ze stresem matek dzieci z zaburzeniami ze spektrum autyzmu. Wych Rodz. 2023; 30(4): 307-327.
35. Świerczyńska J, Pawłowska B, Chojnowska-Ćwiąkała I. Mothers' temperament and psychosocial functioning of children with autism spectrum disorder. Med Stud. 2023; 39(3): 249-259.

Address for correspondence

Justyna C. Świerczyńska
Department of Psychology
Jan Kochanowski University
ul. Krakowska 11, 25-029 Kielce, Poland
E-mail: j_swierczynska@wp.pl

Received: 24.09.2024
Accepted: 28.04.2025
Online publication: 11.03.2026