UDC 613.95:159.922.7:373.3

Yu.V. Marushko, S.A. Rudenko

The formation of schoolchildren's health under the influence of medical and psychological factors: challenges of the modern school

Bogomolets National Medical University, Kyiv, Ukraine

Modern Pediatrics. Ukraine. (2025). 1(145): 47-56; doi 10.15574/SP.2025.1(145).4756

For citation: Marushko YuV, Rudenko SA. (2025). The formation of schoolchildren's health under the influence of medical and psychological factors: challenges of the modern school. Modern Pediatrics. Ukraine. 1(145): 47-56. doi: 10.15574/SP.2025.1(145).4756.

The growing prevalence of chronic non-communicable diseases among children highlights the need to examine the role of psychological and medical factors in shaping schoolchildren's health.
The study **aimed** to analyze how psychological personality traits (PPT) and associated behavioral risks contribute to the formation of respiratory (RSD) and digestive system diseases (DSD), and to justify the implementation of preventive medical and psychological interventions.
Materials and methods. A randomized controlled study included 1,110 children aged 9–17 years and used a double-blind design. Health indicators were assessed in relation to established PPTs such as anxiety, aggressiveness, impulsivity, insecurity, externality, asociality and aesthetic insensitivity. Data collection and analysis were performed using the Universal Online system, version 45.
Results. Anxiety significantly increased the risk of DSD (OR=2.16), while its association with RSD was not statistically significant (OR=1.29). Dishonesty was found to be a notable risk factor for RSD. Asociality was a significant predictor for both RSD (OR=1.53, 95% CI: 1.00–2.36) and DSD (OR=1.89, 95% CI: 1.23–2.91). These findings emphasize the importance of early detection of psychological risk factors to prevent systemic dysfunctions and atypical disease courses.
Conclusions. Psychological traits can act as significant medical risk factors, contributing to the development of somatic disorders during the educational process. The integration of psychological screening and support into school health programs may reduce disease incidence, improve children's adaptation, and enhance educational outcomes. Multidisciplinary support from parents, teachers, and health professionals is essential to mitigate the negative impact of harmful traits and promote healthier development.
No conflict of interest was declared by the authors.
Keywords: schoolchildren's health, psychological traits, anxiety, impulsivity, asociality, respiratory diseases, digestive diseases.

Формування здоров'я школярів під впливом медичних і психологічних факторів: виклики сучасної школи

Ю.В. Марушко, С.А. Руденко

Національний медичний університет імені О.О. Богомольця, м. Київ, Україна

Зростання поширеності неінфекційних захворювань серед дітей зумовлює потребу у вивченні ролі психологічних і медичних чинників у формуванні здоров'я школярів.
Метою дослідження був аналіз впливу психологічних особливостей особистості (ПОО) на розвиток захворювань дихальної (ЗДС) та травної систем (ЗТС), а також обґрунтування необхідності запровадження медико-психологічної профілактики.
Матеріали і методи. Було проведено рандомізоване контрольоване дослідження за участю 1110 дітей віком 9–17 років із застосуванням методу подвійного сліпого контролю. Оцінювалися показники здоров'я у зв'язку з наявністю сформованих ПОО: тривожність, агресивність, імпульсивність, невпевненість, екстернальність, асоціальність, естетична нечутливість. Збір і аналіз даних здійснювався через систему Universal Online, версія 45.
Результати. Тривожність достовірно підвищувала ризик розвитку ЗТС (OR=2,16), але не мала значущого зв'язку із ЗДС (OR=1,29). Нечесність була важливим фактором ризику ЗДС. Асоціальність значуще впливала на ризик як ЗДС (OR=1,53; 95% ДІ: 1,00–2,36), так і ЗТС (OR=1,89; 95% ДІ: 1,23–2,91). Це підтверджує необхідність ранньої ідентифікації психологічних ризиків для запобігання системним розладам.
Висновки. Психологічні особливості можуть виступати вагомими медичними факторами ризику розвитку соматичних захворювань у шкільному віці. Інтеграція психологічного скринінгу в систему шкільної медицини сприятиме зменшенню захворюваності, покращенню адаптації дітей і їхніх навчальних результатів. Важливим є міждисциплінарний підхід за участю батьків, вчителів і медичних фахівців.
Автори заявляють про відсутність конфлікту інтересів.
Ключові слова: здоров'я школярів, психологічні особливості, тривожність, імпульсивність, асоціальність, захворювання дихальної системи, захворювання травної системи.

Introduction

The health and well-being of school-aged children depend not only on their physical condition but also on their psychological, emotional, and social development, both in the short and long term. Increasing attention is being paid to the role of individual personality traits as determinants of behavior, a concept rooted in longstanding psychological traditions. These traits may influence children's ability to adapt to the educational environment, cope with stress, and maintain resilience, thereby shaping their overall health trajectory [1–5].

The term «psychological personality traits» (PPT) remains highly relevant in contemporary medicine and psychology, as it provides a framework

for understanding and explaining individual differences in children's behavior under similar conditions [7,8]. Numerous studies have demonstrated a significant association between specific PPTs and various health-related outcomes in children, including the development of psychosomatic disorders and the level of academic achievement. These findings highlight the importance of integrating psychological assessment into pediatric and educational practices to support early intervention and promote overall well-being [9–13].

Scholars emphasize that the conditions of the modern educational environment exert a considerable influence on both the somatic and mental health of students. Elevated levels of psycho-emotional stress associated with academic demands contribute to an increased frequency of stressful experiences, which may compromise the body's protective and adaptive mechanisms. Over time, this disruption can facilitate the development of pathological conditions and chronic diseases, underscoring the need for preventive strategies within the educational system [14–17]. Anxiety typically arises in situations involving uncertainty or perceived danger, manifesting as an anticipatory response to potential adverse outcomes. This mental state is characterized by emotional tension, heightened vigilance, persistent worry, psychological discomfort, increased sensitivity to stress, a pronounced sense of guilt, and self-devaluation. In children, such experiences, especially in contexts marked by ambiguity or the anticipation of an undefined threat to their sense of security – can contribute to the development of a persistent feeling of insecurity and emotional instability [18–19]. Aggressiveness may lead to increased exposure to conflict and stressful situations, thereby negatively impacting overall physical and mental health. Impulsivity is recognized as a significant behavioral trigger for high-risk actions, including substance abuse. Introversion, in turn, often manifests as psychological detachment, wherein the child withdraws from social interactions and becomes immersed in internal experiences and personal concerns. These psychological traits, when pronounced or left unaddressed, may hinder healthy social adaptation and contribute to the development of maladaptive behavioral patterns [20–24].

Behavioral changes in children can contribute significantly to improved health outcomes, enhanced academic performance, and the development of cognitive abilities. A deeper understanding of the influence of established PPT on health enables the creation of more targeted and effective prevention and rehabilitation strategies. This, in turn, ensures comprehensive support for the harmonious development of school-aged children. The educational environment, which some researchers regard as a dominant factor influencing child development, plays a critical role in this process. Therefore, the timely identification, diagnosis, and correction of maladaptive or risk-related PPT are essential components in promoting the child's psychological well-being and overall developmental success [25].

Despite the growing recognition of the importance of social determinants in shaping the health of school-aged children, this issue remains insufficiently explored in contemporary research. This gap has served as the primary motivation for our scientific inquiry. Particular attention in this study is given to the need for developing comprehensive preventive, therapeutic, and rehabilitative programs that consider the influence of key social factors – such as family environment, peer interactions, school climate, and socioeconomic status – on children's physical and mental health. The timely identification and mitigation of negative social influences are essential to promoting holistic and sustainable health outcomes in the educational context.

The aim of this study was to examine the characteristics of health formation in school-aged children under the influence of key social factors, with the goal of substantiating the need for comprehensive preventive, therapeutic, and rehabilitative measures that combine medical, psychological, and social support within the educational process.

Materials and methods of the study

A randomized controlled study was conducted involving 1,934 middle school students aged 7 to 14 years. Participants were divided into two groups: the Main group (n=1,199) and the Control group (n=735). The study was implemented with prior written informed consent from parents or legal guardians. The research process included active participation of school psychologists, teachers, and medical professionals who provided coordinated social, psychological, and medical support to the children. The distribution of participants by age and group is presented in Table 1.

Table 1

Number and age distribution of children in the study groups (number of children, %).

Groups	Main group	Control group	Total
Children of the younger school-age group Grades 1–4 (9–10 years)	176 (63.5%)	101 (36.5%)	277 (100%)
Children of the middle school-age group (11–15 years)	698 (59.6%)	474 (40.4%)	1172 (100%)
Children of the older school-age group (16–18 years)	325 (67.0%)	160 (33.0%)	485 (100%)
Всього	1199 (62.0%)	735 (38.0%)	1934 (100%)

The statistical analysis revealed a significant correlation between data obtained from different study groups. Statistical significance at the level of $p<0.05$ was confirmed across various age categories of participants. Morbidity analysis focused on diseases of the respiratory and digestive systems and was conducted by qualified medical professionals during routine preventive and dispensary examinations. These data were systematically collected through continuous observation over an eight-year period (2013–2021). To ensure comparability and minimize bias, a systematic meta-analytical approach was applied in constructing the research database, with careful selection of randomized controlled samples stratified by age and gender.

Assessment of physical development (body weight, height, and chest circumference) was performed using age-specific percentile tables, the harmony index, and the Rurer weight-to-height index.

Statistical analysis included descriptive statistics, regression analysis, and evaluation of the validity of sample indicators. Data reliability was confirmed through the calculation of odds ratios (OR) with corresponding 95% confidence intervals (CI).

The evaluation of PPT was carried out using the validated Ukrainian version of the «DVOR» questionnaire [14]. This tool allows for the detection of deviations in personality development in children aged 9 to 17 years and was administered using a double-blind methodology for both participants and researchers. The results of the survey enabled the identification, structuring, and ranking of established PPTs. A correlation matrix was employed to explore the interrelationship between health indicators and PPTs. Additionally, multifactorial correlation matrices were constructed to compute multiple linear regressions and reveal complex dependencies among variables.

Results of the study

The primary objective of this study was to determine the relationship between health indicators and PPT in school-aged children within the educational environment.

To assess the presence of established PPTs among children (n=1,110), the validated Ukrainian version of the «DVOR» diagnostic methodology was employed. This tool enables the identification of key personality deviations, including anxiety, impulsiveness, aggressiveness, dishonesty, asociality, introversion, insecurity, externality, and aesthetic insensitivity. The distribution and prevalence of these psychological traits in the studied population are presented in Table 2.

The statistical analysis revealed a significant difference ($p<0.05$) in the levels of anxiety, impulsiveness, aggressiveness, insecurity, and externality between the Main and Control groups, indicating varying degrees of expression of these traits across the samples. In contrast, no statistically significant difference was observed in the levels of aesthetic insensitivity, suggesting a similar prevalence of this trait in both groups. These findings indicate that, with the exception of aesthetic insensitivity, most psychological characteristics exhibit differential patterns of manifestation between children in the Main and Control groups.

A focused analysis was conducted on six key personality traits in school-aged children: anxiety, impulsiveness, aesthetic insensitivity, aggressiveness, insecurity, and externality. Each trait was assessed at three levels of manifestation–high, medium, and low–in both study groups. The analysis was based on the calculation of OR with corresponding 95% CI, enabling a more precise evaluation of the strength and significance of associations between group membership and specific psychological traits.

For anxiety, it was found that at high (OR=0.69, CI 0.51–0.93) and medium levels (OR=0.58, CI 0.46–0.75), it was less pronounced in the Main group compared to the Control group. At the low level, however, anxiety was more frequently observed in the Main group (OR=2.16, CI 1.69–2.75), which may indicate the influence of PPT on reducing high and medium levels of anxiety. Impulsiveness

Table 2

Prevalence of psychological personality traits (PPT) in school-aged children

Social Priority	Level of problem formation	Main group	Control group	Total	p	OR (95% CI)
1. Anxiety	High	93 (17.7%)	138 (23.6%)	231 (20.8%)	<0.05	0.69 (0.51–0.93)
	Medium	162 (30.8%)	252 (43.2%)	414 (37.3%)		0.58 (0.46–0.75]
	Low	272 (51.5%)	193 (33.2%)	465 (41.9%)		2.16 (1.69–2.75)
2. Impulsivity	High	47 (8.5%)	105 (17.2%)	152 (13.7%)	<0.05	0.45 (0.31–0.64)
	Medium	167 (31.1%)	207 (35.5%)	374 (33.7%)		0.84 (0.66–1.08)
	Low	318 (60.4%)	276 (47.3%)	536 (53.5%)		1.68 (1.33–2.13)
3. Aesthetic Insensitivity	High	34 (6.5%)	37 (6.3%)	71 (6.4%)	>0.05	1.02 (0.63–1.65)
	Medium	172 (32.7%)	177 (30.5%)	353 (31.8%)		1.11 (0.86–1.43)
	Low	321 (60.8%)	369 (63.2%)	676 (61.8%)		0.90 (0.71–1.15)
4. Aggressiveness	High	46 (8.7%)	130 (21.6%)	176 (15.8%)	<0.05	0.33 (0.23–0.48)
	Medium	171 (32.5%)	171 (30.0%)	342 (30.8%)		1.16 (0.90–1.49)
	Low	310 (58.8%)	282 (48.4%)	592 (53.4%)		1.52 (1.20–1.93)
5. Insecurity	High	11 (2.2%)	33 (5.6%)	44 (4.0%)	<0.05	0.35 (0.18–0.71)
	Medium	132 (24.8%)	94 (16.2%)	227 (20.4%)		1.73 (1.29–2.33)
	Low	385 (73.0%)	456 (76.2%)	139 (75.6%)		0.75 [0.57, 0.99]
6. Externality	High	182 (34.6%)	135 (23.0%)	317 (28.5%)	<0.05	1.75 (1.35–2.28)
	Medium	197 (37.2%)	232 (39.8%)	429 (38.9%)		0.90 (0.71–1.15)
	Low	148 (28.2%)	216 (37.2%)	364 (32.8%)		0.66 (0.51–0.86)
Total		527 (57.5%)	583 (52.5%)	1110 (100%)	-	

at a high level was less expressed in the Main group (OR=0.45, CI 0.31–0.64), while no significant difference was found at the medium level (OR=0.84, CI 0.66–1.08). At the low level, impulsiveness was significantly more common in the Main group (OR=1.68, CI 1.33–2.13).

Regarding aesthetic insensitivity, no significant differences were found between the groups at any level: high (OR=1.02, CI 0.63–1.65), medium (OR=1.11, CI 0.86–1.43), and low (OR=0.90, CI 0.71–1.15). This suggests that this personality trait is equally expressed in both groups. Aggressiveness was significantly less pronounced in the Main group at the high level (OR=0.33, CI 0.23–0.48), while no significant difference was observed at the medium level (OR=1.16, CI 0.90–1.49). At the low level, aggressiveness was more frequently found in the Main group (OR=1.52, CI 1.20–1.93).

Insecurity was significantly lower in the Main group at the high level (OR=0.35, CI 0.18–0.71), but at the medium level, it was more frequent in the Main group (OR=1.73, CI 1.29–2.33). At the low level, a slight decrease in insecurity was observed in the Main group (OR=0.75, CI 0.57–0.99). Externality was more often observed in the Main group at the high level (OR=1.75, CI 1.35–2.28), while no significant difference was found at the medium level (OR=0.90, CI 0.71–1.15). At the low

Table 3

Statistical analysis of the impact of psychological personality traits on the development of respiratory diseases (RD)

Parameter	Parameter Healthy	RSD (Present) n (%)	RSD (Absent) n (%)	p-value	OR (95% CI)
Anxiety	Parameter	59 (13.3)	384 (86.7)	>0.05	1.29 (0.89–1.89)
	Healthy	65 (10.6)	549 (89.4)		
Impulsiveness	Parameter	67 (11.8)	500 (88.2)	>0.05	1.01 (0.69–1.48)
	Healthy	57 (11.6)	433 (88.4)		
Aggressiveness	Parameter	67 (12.0)	490 (88.0)	>0.05	1.06 (0.72–1.55)
	Healthy	57 (11.4)	443 (88.6)		
Dishonesty	Parameter	50 (15.3)	276 (84.7)	<0.05	1.61 (1.09–2.36)
	Healthy	74 (10.1)	657 (89.9)		
Asociality	Parameter	34 (15.6)	184 (84.4)	<0.05	1.53 (1.00–2.36)
	Healthy	90 (10.7)	749 (89.4)		
Introversion	Parameter	30 (9.9)	274 (90.1)	>0.05	0.77 (0.49–1.18)
	Healthy	94 (12.5)	659 (87.5)		
Insecurity	Parameter	98 (12.1)	710 (87.9)	>0.05	1.23 (0.78–1.95)
	Healthy	26(10.4)	233 (89.6)		
Externality	Parameter	29 (8.5)	313 (95.1)	<0.05	0.60 (0.39–0.93)
	Healthy	95 (13.3)	620 (86.7)		
Aesthetic Insensitivity	Parameter	71 (11.0)	576 (89.0)	>0.05	0.83 (0.57–1.21)
	Healthy	53(12.9)	357 (87.1)		

*Notes: R*SD (Present) – the number and percentage of children with respiratory system disease; RSD (Absent) – the number and percentage of children without respiratory system disease; p-value – the probability value indicating statistical significance; OR (95% CI) – odds ratio with a 95% confidence interval.

level, it was less expressed in the Main group (OR=0.66, CI 0.51–0.86).

These results suggest that PPT can differ significantly between groups, particularly at different levels of expression. Such differences may indicate the importance of social factors in shaping the psychological characteristics of school-aged children.

For anxiety-related PPT, statistically significant differences were identified at all levels ($p<0.05$), confirming the distributional differences between the Main and Control groups. Impulsiveness revealed significant differences at the high and low levels ($p<0.05$) but not at the medium level. Aesthetic insensitivity showed no significant differences at any level ($p>0.05$), indicating similarity between the groups.

Aggressiveness demonstrated significant differences at the high and low levels ($p<0.05$), while no statistically significant difference was found at the medium level. For the personality trait «insecurity,» significant differences were observed at all levels, although the p-value for the low level was close to the threshold ($p=0.047$). Externality also showed significant differences at the high and low levels ($p<0.05$), while no significant difference was noted at the medium level.

To study the mutual influence of health factors and established PPT, a randomized controlled trial was conducted using a multifactorial model combining indicators of physical health and PPT. The analytical database of the study included the results of medical and psychological assessments of 1,255 students from two educational institutions, with $n_1=546$ (43.5%) and $n_2=709$ (56.5%). The percentage of girls in the Main group was 54.9%, and in the Control group, 53.5%, with no significant differences in gender distribution between the institutions. The age of study participants in both groups ranged from 9 to 16 years, with the mean age being the same in both groups, at 12.5 years.

To characterize the influence of PPT on health, a multidimensional model (Model №1) was developed to describe the impact of factors on the occurrence of respiratory system diseases (RSD). The model included 208 components. The results of studying the influence of PPT on the formation of RSD are presented in Table 3.

The data in Table 3 indicate that PPT can significantly influence the development of RSD. The study analyzed nine different psychological characteristics: anxiety, impulsiveness, aggressiveness, dishonesty, asociality, introversion, insecurity, externality, and aesthetic insensitivity.

Based on the obtained OR, p-values, and CI, it can be concluded that dishonesty and asociality are

Table 4

Statistical analysis of psychological personality traits and digestive system diseases (DSD)

Parameter	Parameter, healthy	DSD (Present) n (%)	DSD (Absent) n (%)	p-value	OR (95% CI)
Anxiety	Parameter	66 (14.9)	377 (85.1)	<0.01	2.16 (1.45–3.22)
	Healthy	46 (7.5)	568 (92.5)		
Impulsiveness	Parameter	69 (12.2)	498 (87.8)	>0.05	1.44 (0.96–2.15)
	Healthy	43 (8.8)	447 (91.2)		
Aggressiveness	Parameter	66 (11.8)	491 (88.2)	>0.05	1.33 (0.89–1.97)
	Healthy	46 (9.2)	454 (90.8)		
Dishonesty	Parameter	43 (13.2)	283 (86.8)	>0.05	1.46 (0.97–2.19)
	Healthy	69 (9.4)	662 (90.6)		
Asociality	Parameter	35 (16.1)	183 (83.9)	<0.05	1.89 (1.23–2.91)
	Healthy	77 (9.2)	762 (90.8)		
Introversion	Parameter	31 (10.2)	273 (89.8)	>0.05	0.94 (0.61–1.46)
	Healthy	81 (10.8)	672 (89.2)		
Insecurity	Parameter	78 (9.7)	730 (90.3)	>0.05	0.67 (0.44–1.03)
	Healthy	34 (13.7)	213 (86.3)		
Externality	Parameter	31 (9.1)	311(90.9)	>0.05	0.78 (0.51–1.21)
	Healthy	81 (11.3)	636 (88.8)		
Aesthetic Insensitivity	Parameter	62 (9.6)	585 (90.4)	>0.05	0.76 (0.51–1.13)
	Healthy	50 (12.2)	360 (87.7)		

Notes: DSD (Present) – the number and percentage of children with digestive system diseases; DSD (Absent) – the number and percentage of children without digestive system diseases; p-value – probability value indicating statistical significance; OR (95% CI) – odds ratio with a 95% confidence interval.

significant risk factors for the development of RSD. Specifically, the psychological characteristic «dishonesty» demonstrated a significant increase in the risk of developing RSD with an OR of 1.61, indicating that school-aged children with this trait are 61% more likely to suffer from RSD compared to those without it. A p-value <0.05 confirms that this result is statistically significant.

The presence of the PPT «asociality» is also associated with an increased risk of developing RSD (OR=1.53), indicating a 53% higher likelihood of developing RSD among individuals with this characteristic. A p-value <0.05 further confirms the statistical significance of this result. These findings suggest that individuals with such psychological traits as dishonesty and asociality require special attention in the context of preventing RSD.

The PPT «externality» serves as a protective factor against the development of RSD, with an OR of 0.60, indicating that school-aged children with this trait are 40% less likely to develop RSD. This is the only statistically significant OR value (p<0.05) among the factors that reduce the risk of disease. Other psychological characteristics, such as anxiety, impulsiveness, aggressiveness, introversion, insecurity, and aesthetic insensitivity, showed OR values close to 1, suggesting no substantial effect of these traits on the risk of developing RSD. For these characteristics, the p-values exceeded 0.05, indicating a lack of statistical significance and suggesting that these results may be coincidental. Accordingly, these traits should not be considered important risk factors for RSD prevention.

Since dishonesty and asociality were identified as significant risk factors, it is necessary to implement psychological and educational programs aimed at correcting these traits, particularly among children and adolescents. Such interventions can help reduce the risk of developing RSD. Additionally, strengthening protective factors, particularly externality, which demonstrated a protective effect, is crucial. Supporting this trait by developing self-regulation skills and a sense of responsibility in children can contribute to reducing the risk of RSD.

The influence of PPT on the development of digestive system diseases (DSD) was also studied. The results of studying the impact of PPT on the formation of DSD are presented in Table 4.

According to the data presented in Table 8, there is a statistically significant association between the presence of anxiety and the development of DSD. Students with anxiety have approximately

2.16 times higher odds of developing DSD compared to those without this psychological trait. It was also found that impulsiveness is associated with a slightly increased likelihood of developing DSD; however, this association is not statistically significant as the p-value exceeds 0.05. Similarly, aggressiveness does not show a statistically significant link with DSD.

There is a statistically significant association between asociality and DSD. Students with asocial traits have nearly twice the odds of developing DSD compared to those without these traits. The OR for asociality is 1.89 (95% CI 1.23–2.91), with a p-value <0.05. Traits such as introversion, insecurity, externality, and aesthetic insensitivity do not show a significant impact on the formation of DSD. Although the OR values below 1 suggest a potential reduction in risk, this association is not statistically confirmed.

The aim of the comparative analysis of the data presented in Tables 7 and 8 was to identify which psychological traits affect the development of RSD and DSD and to compare their impact. The comparative analysis revealed that anxiety is a significant risk factor for DSD, increasing the risk of these diseases by more than twofold (OR=2.16). However, in the case of RSD, this risk is not statistically significant. This indicates that anxiety has a greater influence on the digestive system compared to the respiratory system.

Impulsiveness did not show a significant effect on the development of either RSD or DSD. However, the OR for DSD is higher, which may indicate a slightly greater influence on the development of DSD, although this association is not statistically significant. Similar to impulsiveness, aggressiveness also did not demonstrate a significant impact on the development of either type of disease. Although the OR for DSD is somewhat higher, this effect does not reach the level of statistical significance.

Dishonesty is a significant risk factor for RSD, but not for DSD. This suggests that dishonesty has a greater impact on the risk of developing respiratory diseases, which requires special attention from psychologists in the context of RSD prevention.

Introversion did not show a significant effect on the development of either type of disease. Although an OR of less than 1 might indicate a possible protective effect, none of the results are statistically significant, suggesting a lack of clear evidence for the impact of this trait. Similarly, insecurity did not show a statistically significant effect on the development of either disease type, although an inverse relationship was observed for DSD (OR<1), indicating a potential protective effect. However, this association is not significant.

Externality demonstrated a significant protective effect against RSD (OR=0.60, p<0.05), but not against DSD. This suggests that externality may play an important role in protection against RSD, while the effect on DSD is not statistically significant. Aesthetic insensitivity did not show a significant impact on the development of either type of disease. While the OR values suggest a potential protective effect, none of the results are statistically significant.

The results of the data analysis show that the coefficient of determination, R^2=0.474, indicates that 47.4% of the variation in the dependent variable for DSD can be explained by this regression model. This points to a moderate level of explanatory power for the model. The adjusted R^2=0.298, which takes into account the number of independent variables, indicates that the model may not be highly robust for predicting DSD outcomes.

The obtained results indicate the need for further research to confirm or refine the identified associations.

Discussion

Although the Cochrane Library and PubMed scientific databases – recognized as leading platforms in modern evidence-based medicine – contain a substantial number of studies examining the influence of PPT on the health of school-aged children, most of these investigations do not specifically address the impact of already established PPTs. This gap in research limits the ability to identify clear interrelationships between psychological traits and the physical health status of children. As a result, the development of effective, comprehensive medical and social strategies for prevention and rehabilitation – particularly within the framework of the educational process – is significantly constrained.

Social factors are among the most prevalent and influential determinants of the physical and mental health, development, and functioning of schoolchildren. For instance, children growing up in poverty face a wide range of adverse health outcomes, including higher levels of chronic diseases and mental health issues. Digital technologies and social media can negatively impact sleep, physical activity, and

mental health, contributing to increased levels of anxiety, often in ways that are not yet fully understood by researchers. The school environment also plays an important role in shaping the mental health of children; a more positive school climate is associated with lower levels of emotional and behavioral symptoms, an effect that has proven stronger than the school's socioeconomic status [7,8]. Social factors significantly affect the quality of children's nutrition during schooling, which may lead to the development of chronic diseases and psychological deviations [19,21]. Moreover, family and the child's microsocial environment have a significant impact on the formation of health and mental development in the context of education [11,21].

According to randomized controlled trials, anxiety has negative effects on the formation of physical health. Our comparative analysis of the influence of psychological traits on the development of RSD and DSD confirmed that anxiety is a significant risk factor for the development of DSD – OR=2.16, 95% CI 1.45–3.22, $p<0.01$, indicating more than a twofold increased risk of developing these diseases among individuals with anxiety. In contrast, for RSD, this risk is not statistically significant – OR=1.29, 95% CI 0.89–1.89, $p>0.05$. Impulsiveness is also an important psychological trait, underlying the formation of risk behaviors [5,7,9,22]. However, in this analysis, aggressiveness did not demonstrate a significant impact on the risk of developing diseases.

Dishonesty is a significant risk factor for the development of RSD – OR=1.61, 95% CI 1.09–2.36, $p<0.05$, but not for DSD – OR=1.46, 95% CI 0.97–2.19, $p>0.05$. This indicates that dishonesty may have a greater impact on the risk of developing respiratory diseases, while its connection to DSD is less pronounced. At the same time, we did not find studies in the scientific literature that confirm or refute these findings regarding the influence of dishonesty on the development of physical diseases. The study of the impact of dishonesty on the formation of PPT requires further investigation.

In the study [23], the authors pay significant attention to the impact of asociality on health formation, particularly the influence of social isolation on the development of psychosomatic diseases. According to the results of our study, asociality is a significant risk factor for the development of both DSD and RSD, with its impact being somewhat stronger on DSD (OR=1.89, 95% CI 1.23–2.91, $p<0.05$) compared to RSD (OR=1.53, 95% CI 1.00–2.36, $p<0.05$). This indicates that asociality is an important risk factor for both groups of diseases, highlighting the need to consider this trait in preventive measures for both types of diseases.

Randomized controlled trials have indicated a link between aggressive behavior and an increased risk of cardiovascular diseases. A systematic randomized study has demonstrated the importance of a comprehensive approach to implementing social-emotional learning, which contributes to the elimination of negative social factors and, consequently, improves both physical and mental health [8,11,22]. Another systematic review and meta-analysis suggest that future research should focus on identifying mechanisms that link physical and social health. The authors of this study emphasize that children with low socioeconomic status are at a higher risk of developing chronic diseases and psychological problems. They are more likely to suffer from stress, anxiety, and depression, which are associated with unstable home conditions and limited access to health-supportive resources [5,6,8,15,21].

The authors pay considerable attention to the influence of externality and aesthetic insensitivity on health formation. Research indicates that children who receive emotional support from parents and teachers exhibit better mental and physical health, as well as higher self-esteem. The absence of such support can lead to the development of mental disorders, making it crucial for children to receive professional psychological assistance during their schooling [6,8,11].

To address these issues, it is crucial not only to develop educational and professional programs but also to provide psychological and social support to children and their families. The growing problems among school-aged children highlight the need for joint preventive measures involving doctors, educators, and psychologists. A comprehensive approach to analyzing social and psychological factors is necessary for understanding and improving the health of school-aged children, as confirmed by research presented in scientific literature.

Conclusions

The conducted analysis, supported by data from the PubMed and Cochrane Library databases, confirms a close association between children's health and established PPT. Enhancing the overall health of school-aged children through targeted correction

of adverse PPTs may contribute to a reduction in social difficulties, improved social adaptation, and enhanced academic performance. A multidisciplinary approach that integrates the efforts of medical professionals, educators, and psychologists is essential for the effective monitoring and promotion of health quality among children in the educational setting. A comparative analysis of the impact of specific PPTs on the development of RSD and DSD revealed that anxiety is a statistically significant risk factor for DSD (OR=2.16; 95% CI: 1.45–3.22; $p<0.01$), suggesting more than a twofold increase in disease risk among individuals exhibiting this trait. However, anxiety did not significantly affect the risk of RSD (OR=1.29; 95% CI: 0.89–1.89; $p>0.05$). Dishonesty emerged as a significant risk factor for RSD (OR=1.61; 95% CI: 1.09–2.36; $p<0.05$), but not for DSD (OR=1.46; 95% CI: 0.97–2.19; $p>0.05$), indicating its stronger association with respiratory pathologies. Asociality was identified as a significant risk factor for both types of diseases, with a more pronounced effect on DSD (OR=1.89; 95% CI: 1.23–2.91; $p<0.05$) compared to RSD (OR=1.53; 95% CI: 1.00–2.36; $p<0.05$). This underscores the importance of considering asocial behavior in preventive strategies targeting both disease groups. Other psychological traits, including impulsiveness, aggressiveness, introversion, insecurity, and aesthetic insensitivity – did not demonstrate statistically significant associations with the risk of developing either RSD or DSD in this analysis.

In creating a correlation matrix to establish the OR for RSD and DSD, the correlation coefficient between OR for RSD and DSD was found to be 0.64, indicating a moderate positive relationship. This suggests that factors influencing the risk of one type of disease may have a similar effect on the other. The relationship between OR for RSD and the p-value for DSD showed a weak negative correlation coefficient of -0.20, indicating that as the OR for RSD increases, the significance of the effect on DSD decreases, although this association is weak. The correlation coefficient between OR for DSD and the p-value for DSD was -0.63, indicating a noticeable negative relationship. This implies that as the OR for DSD increases, the significance of this indicator decreases, which is typical in the analysis of statistical data.

The applied model has a moderate level of explanatory power, with $R^2=0.474$, indicating that approximately 47.4% of the variation in the dependent variable p for DSD can be explained by this regression model. With a moderate level of explanatory power, the overall statistical significance of the model is low (p-value = 0.146). The effect of the OR for RSD is minimal and positive, while the OR for DSD has a negative effect on the dependent variable p for DSD. These results highlight the need for further research to confirm or clarify the identified relationships.

Comprehensive support for children with established PPT from parents, teachers, and psychologists can help them better adapt to these characteristics and use them for their personal development.

The integration of psychological counseling with medical supervision and social skills development programs plays a significant role in promoting positive personality traits and reducing the negative impact of psycho-emotional factors on health, particularly in relation to RSD and DSD. Effective prevention and correction of psychosomatic disorders require a multidisciplinary approach that combines medical monitoring with individualized psychological support. Comprehensive child development support programs should be age-appropriate and consider the psychosocial challenges faced by school-aged children in the educational process.

A key factor in the success of such programs is close collaboration among healthcare professionals, psychologists, educators, and parents, which ensures early identification of risk factors and contributes to the enhancement of both physical and mental health in schoolchildren.

The authors declare no conflict of interest.

REFERENCES/ЛІТЕРАТУРА

1. Allison MA, Crane LA, Beaty BL, Davidson AJ, Melinkovich P, Kempe A. (2007). School-based health centers: Improving access and quality of care for low-income adolescents. Pediatrics. 120(4): e894-e901.
2. Allport GW. (1937). Personality: Psychological Interpretation. Holt, Rinehart & Winston.
3. Allport GW. (1955). Becoming: Basic Considerations for Psychology of Personality. Yale University Press.
4. Boers E, Afzali MH, Newton NC, Conrod PJ. (2019). Association of screen time and depression in adolescence. JAMA Pediatrics. 173(9): 853-859.
5. Burt SA, Donnellan MB. (2008). Personality and depression in children and adolescents: A meta-analysis. Clinical Psychology Review. 28(6): 895-916.
6. Cacioppo JT, Hawkley LC, Cacioppo JT, Hawkley LC. (2003). Social isolation and health, with an emphasis on underlying mechanisms. Psychosomatic Medicine. 65(2): 227-237.
7. Cattell RB, Eber HW. (1950). The 16 Personality Factor Questionnaire. Institute for Personality and Ability Testing.
8. Currie C, Zanotti C, Morgan A, Currie D et al. (2012). Social determinants of health and well-being among young people.

In: Health Behaviour in School-aged Children (HBSC) study: International report from the 2009/2010 survey.
9. De Wit H. (2009). Impulsivity as a determinant and consequence of drug use: A review of underlying processes. Addiction Biology. 14(1): 22-31.
10. Eysenck HJ. (1967). The Biological Basis of Personality. Charles C. Thomas.
11. Fenwick-Smith A, Dahlberg EE, Thompson SC. (2018). Systematic review of resilience-enhancing, universal, primary school-based mental health promotion programs. BMC Psychology. 6(1): 30.
12. Godin K, Leatherdale ST, Elton-Marshall T. (2015). A systematic review of the effectiveness of school-based obesity prevention programs for First Nations, Inuit and Métis youth in Canada. Obesity Reviews. 16(12): 1030-1040.
13. Jouanna J. (2012). The legacy of the Hippocratic treatise The Nature of Man: The theory of the four humors. In: J. Jouanna (Ed.), Greek Medicine from Hippocrates to Galen: Selected Papers: 335-360.
14. Kyrychuk VO, Rudenko SA. (2014). Design Technologies in the Practice of General Educational Institutions: Theoretical and Practical Aspect. Kyiv: IOD NAPN Ukrainy. [Киричук ВО, Руденко СА. (2014). Технології проектування в практиці роботи загальноосвітнього навчального закладу: теоретико-практичний аспект. Київ: ІОД НАПН України].
15. Leach MJ, Nichols S, Trenholm S, Jones M. (2021). Health literacy of parents and carers in a regional community: A cross-sectional study. Health Promotion Journal of Australia. 32(3): 475-482.
16. López-Sánchez M, Arango-Paternina CM, Petro-Petro J, Lema-Gómez L, Eusse-López C, Petro JL et al. (2023). Academic performance and social networks of adolescents in a Caribbean city in Colombia. BMC Psychology. 11(1).
17. Maslach C, Leiter MP. (2016). Understanding the burnout experience: Recent research and its implications for psychiatry. World Psychiatry. 15(2): 103-111.
18. O'Farrell P, Wilson C, Shiel G. (2023). Teachers' perceptions of the barriers to assessment of mental health in schools with implications for educational policy: A systematic review. British Journal of Educational Psychology. 93(1): 262-282.
19. Pallan MJ, Hosseinzadeh S, Roustaee R, Adab P, Rashidi M. (2014). Childhood obesity in Iran: A review of the literature. Public Health. 128(1): 83-90.
20. Patalay P, O'Neill E, Deighton J, Fink E. (2020). School characteristics and children's mental health: A linked survey-administrative data study. Preventive Medicine. 141: 106292.
21. Reiss F. (2013). Socioeconomic inequalities and mental health problems in children and adolescents: A systematic review. Social Science & Medicine. 90: 24-31.
22. Smith TW, Gallo LC. (2001). Personality traits as risk factors for physical illness. American Psychologist. 56(4): 252-264.
23. Vincent GE, Barnett LM, Lubans DR, Salmon J, Timperio A, Ridgers ND. (2017). Temporal and bidirectional associations between physical activity and sleep in primary school-aged children. Applied Physiology, Nutrition, and Metabolism. 42(3): 238-242.
24. Webb NJ, Miller TL, Stockbridge EL. (2022). Potential effects of adverse childhood experiences on school engagement in youth: A dominance analysis. BMC Public Health. 22(1): 2096.
25. Whitehead WE, Palsson O, Jones KR. (2002). Systematic review of the comorbidity of irritable bowel syndrome with other disorders: What are the causes and implications? Gastroenterology. 122(4): 1140-1156.

Відомості про авторів:
Марушко Юрій Володимирович – д.мед.н., проф., зав. каф. педіатрії ПО НМУ ім. О.О. Богомольця. Адреса: м. Київ, бульв. Т. Шевченка, 13; тел.: +38 (044) 234-40-62. https://www.scopus.com/authid/detail.uri?authorId=57375654800. https://publons.com/researcher/3152282/yuriy-marushko/. https://orcid.org/0000-0001-8066-9369.
Руденко Сергій Антонович – д.мед.н., доц., доц. каф. педіатрії ІПО НМУ ім. О.О. Богомольця. Адреса: м. Київ, бульв. Т. Шевченка, 13; тел.: +38 (044) 234-40-62. https://orcid.org/0000-0002-1821-204X.
Стаття надійшла до редакції 30.10.2024 р., прийнята до друку 11.02.2025 р.