THE IMPACT OF THE ACTIVE NATION PROGRAM AS A SOCIO-CULTURAL PRACTICE FOR INCREASING PHYSICAL ACTIVITY AMONG 13-YEAR-OLD DISPLACED SCHOOLCHILDREN IN UKRAINE

ВПЛИВ ПРОГРАМИ «АКТИВНА НАЦІЯ» ЯК СОЦІОКУЛЬТУРНОЇ ПРАКТИКИ ДЛЯ ЗБІЛЬШЕННЯ РУХОВОЇ АКТИВНОСТІ СЕРЕД 13-РІЧНИХ ШКОЛЯРІВ-ПЕРЕСЕЛЕНЦІВ В УКРАЇНІ

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DOI https://doi.org/10.32782/2522-1795.2025.19.4.16

Abstracts

The article presents an analysis of the impact of the ACTIVE NATION program on increasing the level of physical activity and physical fitness of 13-year-old displaced schoolchildren in Ukraine under martial law.

The purpose of this study is to determine the effectiveness of the ACTIVE NATION program as a sociocultural practice aimed at increasing physical activity and developing motor skills in 13-year-old displaced schoolchildren in Ukraine.

Research methods. The article presents the results of a study on the impact of the ACTIVE NATION program on the physical fitness and level of physical activity of 13-year-old adolescents in conditions of martial law. There were 34 displaced school kids studying at general education schools in Chernivtsi who took part in the teaching experiment. Only male teens were involved in the study because this subgroup had the most students who signed up to take part in the teaching experiment during recruitment. The following methods were used: analysis and generalization of scientific and methodological literature, documentary materials, logical and theoretical analysis, comparative analysis, synthesis and systematization, pedagogical diagnostics using methods of systematic observation and testing, sociological approaches, and mathematical statistics.

Results. The results of the study confirm the high effectiveness of the ACTIVE NATION program in promoting a healthy and active lifestyle among 13-year-old adolescents. Positive changes were recorded in the ALPHA-Fitness test indicators, which characterize endurance, coordination, and flexibility. The median result of the "20 m shuttle run" test increased from 5.9 segments to 6.7 segments, which is a 13.5% increase in efficiency ($p < 0.05$). In the EUROFIT test, the number of errors in the Flamingo balance test decreased by 11.8% ($p < 0.05$), and the result in the Sit and Reach exercise increased by 14.3% ($p < 0.05$). The assessment of motor tests and PAQ-A showed an increase in daily activity and improvement in motor skills. The results can be explained by the complex components of the program, implemented through events, competitions, and the participation of famous athletes. Even in the school environment, activity during breaks increased by 50.0% ($p < 0.01$).

Conclusions. The results confirm the effectiveness of the ACTIVE NATION program in improving the physical fitness and daily physical activity of 13-year-old adolescents, demonstrating the feasibility of implementing such comprehensive approaches in the context of the current crisis.

Key words: ALPHA-Fitness, EUROFIT, displaced schoolchildren, physical activity, program, social culture.

У статті представлено аналіз впливу програми «АКТИВНА НАЦІЯ» на підвищення рівня фізичної активності та фізичної підготовленості 13-річних переміщених школярів в Україні в умовах воєнного стану.

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Метою дослідження є визначення ефективності програми «АКТИВНА НАЦІЯ» як соціокультурної практики, спрямованої на підвищення фізичної активності та розвиток рухових навичок у 13-річних переміщених школярів в Україні.

Методи дослідження. У статті представлено результати дослідження впливу програми «АКТИВНА НАЦІЯ» на фізичну підготовку та рівень рухової активності 13-річних підлітків в умовах воєнного стану. У педагогічному експерименті взяли участь 34 школярі-переселенці, які навчаються у загальноосвітніх школах м. Чернівці. До дослідження були залучені лише підлітки чоловічої статі, оскільки ця підгрупа становила найбільшу кількість учнів, які під час набору зголосилися взяти участь у педагогічному експерименті. Використовувалися такі методи, як: аналіз і узагальнення науково-методичної літератури, документальних матеріалів, логіко-теоретичний аналіз, порівняльний аналіз, синтез і систематизація, педагогічна діагностика з використанням методів систематичного спостереження і тестування, соціологічні підходи, математична статистика.

Результати дослідження. Результати дослідження підтверджують високу ефективність програми «АКТИВНА НАЦІЯ» у пропагуванні здорового та активного способу життя серед 13-річних підлітків. Позитивні зміни були зафіксовані в показниках тесту ALPHA-Fitness, що характеризують витривалість, координацію та гнучкість. Медіанний результат тесту «20 м шаттл-біг» збільшився з 5,9 сегмента до 6,7 сегмента, що становить 13,5% підвищення ефективності ($p < 0,05$). У тесті EUROFIT кількість помилок у тесті на рівновагу «Фламінго» зменшилася на 11,8% ($p < 0,05$), а результат у вправі «Сидіти і дотягнутися» збільшився на 14,3% ($p < 0,05$). Оцінка моторних тестів і PAQ-A показала збільшення щоденної активності та поліпшення моторних навичок. Результати можна пояснити комплексними компонентами програми, реалізованими через заходи, змагання та участь відомих спортсменів. Навіть у шкільному середовищі активність під час перерв збільшилася на 50,0% ($p < 0,01$).

Висновки. Результати підтверджують ефективність програми «АКТИВНА НАЦІЯ» у поліпшенні фізичної форми та щоденної фізичної активності 13-річних підлітків, демонструючи доцільність впровадження таких комплексних підходів в умовах поточної кризи.

Ключові слова: ALPHA-Fitness, EUROFIT, школярі-переселенці, фізична активність, програма, соціальна культура.

Introduction. Recently, human life has undergone significant changes due to the consequences of military actions on the territory of Ukraine and the COVID-19 pandemic, which have resulted in a substantial decrease in the physical activity of schoolchildren and problems with their social and psychological adaptation to new living conditions [14; 16; 28; 38]. Schoolchildren are currently one of the most vulnerable groups of the population, due to changes in their place of residence, habitual activities, and state of anxiety [29]. In this regard, increasing the level of physical activity enables schoolchildren to adapt to current conditions and is an essential factor in maintaining their health [1; 4]. Military actions on the territory of Ukraine, deterioration of health, problems of social adaptation, and a general decrease in physical activity have had a negative impact on the functioning of society [3; 5].

There are already scientific studies on the impact of physical activity on refugee children [7; 21; 25], but the world has never faced such a large number of displaced children and refugees before. This is currently happening under martial law in Ukraine.

As of June 30, 2025, 4.31 million non-EU citizens who fled Ukraine due to Russian aggression against Ukraine had temporary protection status in the EU [12]. Since 2022, Ukraine has seen a significant number of internally displaced children who require considerable attention, as they have left their homes and schools and changed their way of life in new regions outside their familiar surroundings [20].

There has also been a sharp decline in physical activity levels among schoolchildren. As a result of the military conflict in Ukraine, there is already an alarming trend towards the deterioration of schoolchildren's physical and mental health. This trend creates a number of problems for children (including displaced schoolchildren), as current conditions have significantly reduced their level of physical activity. The health of schoolchildren is currently a significant problem, as the current situation requires children to study remotely, which has a negative impact on their physical condition [14; 34; 39].

The United Nations General Assembly Resolution calls for the inclusion of physical activity and sport in COVID-19 recovery plans and national sustainable development strategies, as physical culture and sport improve physical condition, promote physical and mental health, and prevent disease [18; 25]. It is well known that the COVID-19 pandemic has affected children's motor skills [6; 18; 41].

Based on this, our task is to strengthen schoolchildren's motivation for physical activity and to raise a physically and morally healthy generation that will be able to better adapt to crisis conditions and maintain long-term health. Thanks to the development and implementation of modern mechanisms, we will shape schoolchildren into physically and morally developed individuals.

In Ukraine, programs such as the "National Strategy for Health-Promoting Physical Activity in Ukraine for the Period until 2025", "State Program for the Development of Physical Culture and Sports", and other government documents [45].

Given the current negative health trends, it is important to continue finding ways to increase physical activity levels.

Despite the growing number of studies analyzing the relationship between physical activity and the health of children and adolescents, there is still a lack of practical evidence of the effectiveness of intervention programs specifically designed for displaced schoolchildren living in a state of martial law in Ukraine. Previous studies confirm the positive impact of structured physical activity programs on the development of physical qualities [8; 35], but there is almost no data on their effectiveness in crisis conditions accompanied by displacement, social instability, and limited access to sports infrastructure. This gap highlights the need for targeted research that takes into account the unique sociocultural and psychological challenges faced by this vulnerable group of children.

The aim of this study is to determine the effectiveness of the ACTIVE NATION program as a sociocultural practice aimed at increasing physical activity and developing motor skills in 13-year-old displaced schoolchildren in Ukraine. We hypothesize that participation in the program will result in statistically noteworthy progress in both physical fitness indicators and daily motor activity levels.

Materials and methods.

Participants

The article presents the results of a study of the impact of the ACTIVE NATION program on the physical fitness and level of motor activity of 13-year-old adolescents in martial law conditions. Thirty-four 13-year-old male students from general education schools in Chernivtsi participated in the pedagogical experiment. The study included only male adolescents, since this subgroup represented the largest number of students who volunteered to take part in the pedagogical experiment during recruitment.

The group of schoolchildren participating in the pedagogical experiment was formed randomly. Inclusion criteria were: age of 13 years, male gender, voluntary participation, no health problems or infectious diseases, and no diagnosed mental disorders. Exclusion criteria were: refusal to participate or medical contraindications.

A group of 34 children participated in various activities under the ACTIVE NATION program. At the beginning of the pedagogical experiment, all children were assigned to the main medical group according to the results of a medical examination. The study was conducted under martial law, with frequent air raid sirens and elevated stress levels among participants. These circumstances created an exceptional context that 13-year-old schoolchildren in other countries had not yet encountered, which makes the study particularly valuable for analyzing the impact of crisis factors on children's physical and psychoemotional state.

The research team adhered to ethical principles at all stages. Approval was also obtained from the Ethics Committee of Yuriy Fedkovych Chernivtsi National University. Schoolchildren who participated in the pedagogical experiment provided written consent from their parents and guardians. Particular attention was paid to the anonymity and confidentiality of participants.

Procedure

The study consisted of three main phases: pre-testing, implementation of the ACTIVE NATION program, and final evaluation. The pilot program lasted 120 teaching hours over one academic year, with two after-school classes per week in a blended format (online/offline). The program was built around several evidence-based components (educational, health and physical activity, motivational, socio-psychological, and inclusive), each of which aimed to increase physical activity among schoolchildren and support their adaptation to martial law conditions. Figure 1 shows the basic structure of the program.

The following methods were used in the study: analysis and generalization of scientific and methodological literature, documentary materials, logical and theoretical analysis, comparative analysis, synthesis and systematization, pedagogical diagnostics using methods of systematic observation and testing, sociological approaches, and mathematical statistics.

Physical fitness was assessed using two validated protocols widely applied in European research: the ALPHA-Fitness and EUROFIT batteries. The ALPHA-Fitness test battery was applied as a standardized tool for health-related fitness screening, focusing on cardiorespiratory fitness, muscular strength, and anthropometry [26; 37]. The tests included: Body Mass Index (BMI), Waist circumference, 20 m Shuttle Run Test, Shuttle race 10 × 4 m, Handgrip Strength Test, and Long jump from standing.

In turn, the EUROFIT battery, developed under the auspices of the Council of Europe, was used to assess a broader set of motor qualities and functional fitness [40]. The tests included: Flamingo Balance Test, Plate tapping, Sit and reach, Standing broad jump, Handgrip Strength Test, Push-ups, Sit-ups (1 min), Bent-arm hang, 10 × 5 m agility shuttle run, and 20 m Shuttle Run Test.

Additionally, the Physical Activity Questionnaire for Adolescents (PAQ-A) was administered as a complementary tool to capture the weekly frequency and contexts of adolescents' physical activity [32; 44]. Given the self-report nature of this questionnaire, its reliability was additionally tested in a sample of 13-year-old schoolchildren using Cronbach's alpha coefficient. The obtained indicator $\alpha = 0.815$ indicated sufficient internal consistency of the questionnaire, which meets the accepted psychometric criteria ($\alpha \geq 0.70$), which allows us to state that the PAQ-A in this sample has an appropriate level of reliability and can be used for further analysis.

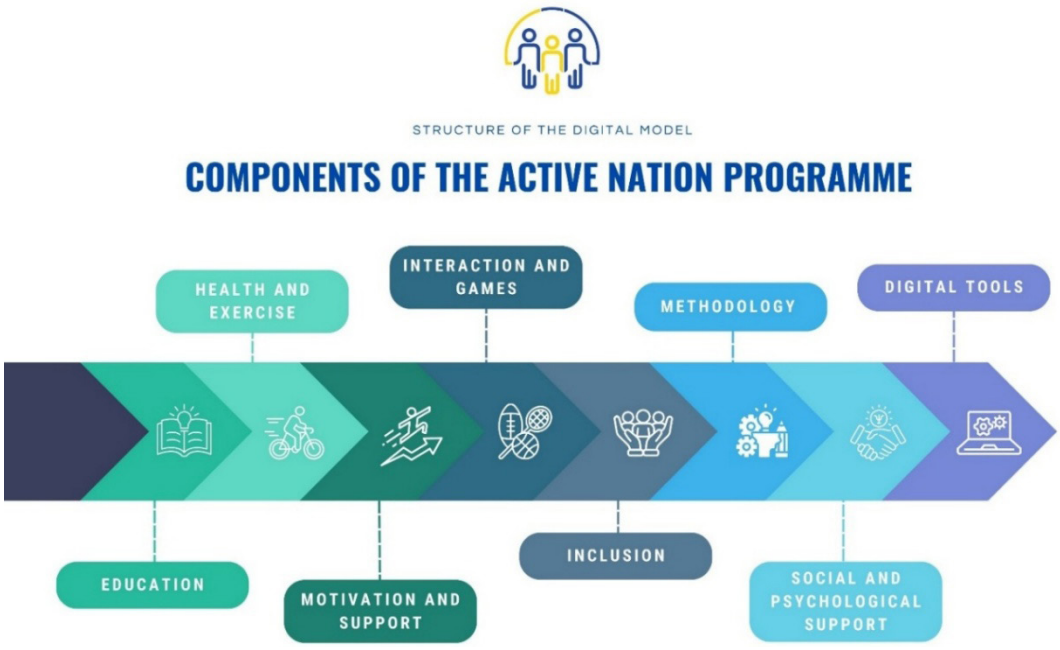

Fig. 1. Structural components of the program to increase physical activity and patriotic education among schoolchildren

Data analysis

Statistical processing of the obtained data was performed using Statistica 10.0, GraphPad Prism 10 and Microsoft Excel 2021 software. The Shapiro–Wilk test was used to check the distribution of indicators for compliance with the normal distribution law. Since most of the data did not correspond to the normal distribution, the results are presented in the form of the median (Me), 25% and 75% percentiles.

The nonparametric Wilcoxon test for dependent samples was used to assess statistically significant differences between indicators at different stages of the study. This test is used to compare two related samples in cases where the data distribution differs from normal or with small sample sizes.

Formula 1. Calculation of the effect coefficient for the Wilcoxon test (for dependent samples), where Z is the standardized value of the Wilcoxon criterion, and N is the number of observations.

$$r = \frac{Z}{\sqrt{N}}$$

The calculation was carried out using the standardized Z indicator, which allows interpreting the results taking into account the direction and strength of the changes. The level of statistical significance was set at $p < 0.05$ and $p < 0.001$, depending on the magnitude of the differences found. Additionally, the effect coefficient (r) was determined, which was calculated using Formula 1.

Results. Numerous scientific studies show that the increase in physical activity among schoolchildren during and after the COVID-19 pandemic has undergone significant changes [6; 16]. This is also due, among other things, to increased levels of anxiety, depression, and other psycho-emotional disorders in children and adolescents in the context of military operations in Ukraine [14].

In order to evaluate the effectiveness of the implementation of the ACTIVE NATION program, a comparative analysis of the development of the basic motor skills of 13-year-old adolescents at the initial and final stages of the study was carried out. The data presented in Table 1 reflect positive dynamics, confirm the program's effectiveness during extracurricular time for schoolchildren, and verify its significant potential for forming an active lifestyle. It should be noted that the duration of the pedagogical experiment was one academic year.

The median BMI results increased by 1.1%, which is primarily attributed to natural biological changes occurring at the age of 13. However, the median waist circumference remained unchanged, with an increase of 1.0 cm observed only at the 75th percentile, which can also be

Table 1

Comparative results of the development of key motor skills in 13-year-old adolescents after the implementation of the ACTIVE NATION program, based on ALPHA-Fitness test indicators (n = 34)

Measured indicators	Results before the pedagogical experiment Me (25%; 75%)	Results after the pedagogical experiment Me (25%; 75%)	Z	r	p
ALPHA-Fitness					
Body Mass Index (BMI)	19.0 (18.8; 21.6)	19.2 (18.9; 22.8)	0.94	0.16	0.31
Waist circumference (cm)	64.0 (58.0; 66.0)	64.0 (58.0; 67.0)	1.72	0.29	0.09
20 m Shuttle Run Test, (stages)	5.9 (4.4; 6.6)	6.7 (6.7; 7.4) *	2.37	0.41	0.02
Shuttle race 10 x 4 m (s)	11.9 (11.4; 12.9)	11.7 (11.1; 12.1)	0.86	0.15	0.24
Handgrip Strength Test (кg)[1]	22.0 (18.0; 24.0)	22.0 (19.0; 24.0)	1.86	0.32	0.07
Long jump from standing (cm)	153.0 (132.0; 168.0)	156.0 (134.0; 171.0)	0.95	0.16	0.33

Note: [1] Average value between the right and left hands. Z – standardized Wilcoxon test statistic; r – effect size coefficient. * The difference is statistically significant at $p < 0.05$; ** – at $p < 0.01$ compared to the baseline results of the pedagogical experiment (using the non-parametric Wilcoxon signed-rank test for dependent samples).

explained by the normal biological growth processes.

Analysis of the results shows certain positive changes in the development of certain motor skills in 13-year-olds after the implementation of the ACTIVE NATION program. The most pronounced changes were recorded in the ALPHA-Fitness tests, which characterize aerobic endurance. Thus, during the 20 m shuttle run test, the median score increased from 5.9 segments to 6.7 segments, which is an increase in efficiency of 13.5% ($p < 0.05$), confirming a significant increase in aerobic endurance.

In other motor tests, the dynamics of changes were less pronounced and did not reach statistical significance ($p > 0.05$). Thus, during the 10 × 4 m shuttle race, the improvement was 1.7%, in the standing long jump, the median result increased by 2.0%, and the median hand dynamometer index did not change at all, although the result at the 25th percentile increased by 1.0 kg. Despite the absence of significant changes, the recorded shifts indicate a general trend towards improving results that characterize the development of strength and speed abilities.

For a qualitative presentation of the results obtained during the pedagogical experiment, and taking into account the heterogeneity of the sample of the studied contingent, we conducted a detailed analysis of individual changes for all studied indicators and presented them in the form of a diagram in Figure 2. When analyzing the results, it should be noted that it is at the age of 13 that significant biological changes in mass-growth processes occur, and it is inappropriate to talk about the impact of the ACTIVE NATION program specifically on indicators that characterize body length and weight, as well as circumference.

As shown in Figure 2, individual BMI results before the pedagogical experiment indicate the presence of both overweight and underweight participants; however, the majority 52.9% of schoolchildren were within the physiological norm. After the pedagogical experiment, the number of schoolchildren whose results were within the norm was 58.9%, but this improvement is not statistically significant ($p > 0.05$). It should also be noted that the BMI indicator for the adolescent population is not entirely informative, especially if schoolchildren are engaged in strength-based physical activities.

The individual waist circumference results of 44.1% of schoolchildren before the pedagogical experiment were within the norm, while 20.6% had results below the age norm, and a total of 35.3% of schoolchildren, on the contrary, fell into the high range, indicating excess body weight. Looking at the dynamics of waist circumference results after the pedagogical experiment, there

Fig. 2. Impact of the ACTIVE NATION program on ALPHA-Fitness test indicators before and after the experiment, in %

was a slight improvement, with 47.0% of schoolchildren within the physiological norm, while the number of individuals with high indicators remained unchanged.

Summarizing the dynamics of results throughout the pedagogical experiment, it is worth noting the increase in BMI, which is primarily attributed to the normal process of body mass and height growth over the school year. A similar result is observed for waist circumference, which showed no median change in either direction, although at the 75th percentile, we observe an increase of 1 cm.

Therefore, considering the dynamics of indicators that characterize physical development, we can conclude that natural processes occurred during the school year in 13-year-old male students. In addition, the high indicators we found in a significant number of schoolchildren remained almost unchanged, which once again indicates that the proposed ACTIVE NATION program is primarily aimed at increasing the level of physical activity and improving the level of physical development, rather than correcting body weight.

For a more comprehensive assessment of physical development, additionally there is the EUROFIT methodology, which allowed us to evaluate coordination abilities, hand motor skills, and flexibility. The results are presented in Table 2.

During the analysis of the results, significant changes were found in the Flamingo Balance Test indicator, where the number of errors decreased by 11.8% ($p < 0.05$), indicating an improvement in static balance. Positive dynamics were also observed in the flexibility indicator, with the median result increasing by 14.3% ($p < 0.05$) during the repeated sit and reach test exercise. Statistically significant changes were also observed in the results of the 20 m shuttle run test, a detailed description of which is provided above in the description of the results using the ALPHA-Fitness method.

In other motor tests, the dynamics of changes were less pronounced and did not reach statistical significance ($p > 0.05$). Thus, during the 10 × 5 m shuttle race, the improvement was 2.2%, in the push-ups and sit-ups test exercises,

Table 2

Comparative results of the development of key motor skills in 13-year-old adolescents after the implementation of the ACTIVE NATION program, based on EUROFIT test indicators (n = 34)

Measured indicators	Results before the pedagogical experiment Me (25 %; 75 %)	Results after the pedagogical experiment Me (25 %; 75 %)	Z	r	p
EUROFIT					
Flamingo Balance Test (errors)	6.8 (5.5; 8.5)	6.0 (5.0; 8.0) **	4.19	0.72	0.001
Plate tapping (s)	12.5 (11.9; 14.4)	12.2; (11.9; 14.4)	0.97	0.17	0.32
Sit and reach (cm)	3.5 (2.0; 5.0)	4.0 (2.0; 6.0) **	4.17	0.71	0.001
Standing broad jump (cm)	160.0 (152.0; 168.0)	163.5 (154.0; 171.0)	1.47	0.25	0.11
Handgrip Strength Test (кg)[1]	18.0 (15.0;19.0)	18.0 (16.0; 19.0)	1.63	0.28	0.21
Push-ups (times)	12,0 (11.0; 14.0)	12.5 (12.0; 15.0)	1.67	0.29	0.09
Sit-ups, 1 min (times)	24.0 (20 0; 27 0)	25.0 (21.0; 28.0)	1.65	0.28	0.22
Bent-arm hang (s)	9.9 (4.0; 15.6)	10.1 (4.5; 16.0)	1.30	0.22	0.18
10×5 m agility shuttle run (s)	13.6 (13.4; 14.2)	13.3 (13.1; 14.1)	0.61	0.10	0.56
20 m Shuttle Run Test, (stages)	5.9 (4.4; 6.6)	6.7 (6.7; 7.4) *	2.37	0.41	0.02

Note: [1] Average value between the right and left hands. Z – standardized Wilcoxon test statistic; r – effect size coefficient. * The difference is statistically significant at $p < 0.05$; ** – at $p < 0.001$ compared to the baseline results of the pedagogical experiment (using the non-parametric Wilcoxon signed-rank test for dependent samples).

the results increased by 4.2%, in the standing long jump by 2.2%, and in the Plate tapping test exercise by 2.4%. Despite the absence of reliable changes, the recorded shifts indicate a general trend towards improving results that characterize the development of strength, hand motor skills, speed abilities, and aerobic endurance.

A detailed analysis, which was carried out using several methods, allowed us to identify positive dynamics in the vast majority of the studied indicators of physical development in 13-year-old schoolchildren. The improvement in aerobic endurance, coordination, hand motor skills, and speed was due to the use of a large number of active games and relays, as well as competitions that were held throughout the school year. Thanks to the health and recreational activities held once a month, schoolchildren became more motivated to systematically engage in their chosen type of physical activity, which positively affected the overall level of development of individual physical qualities.

In addition, to fully assess the effectiveness of the ACTIVE NATION program, we analyzed not only the development of motor skills of adolescents, but also the level of their daily motor activity. In our analysis, we used the stereotypical PAQ-A questionnaire, which assesses adolescents' participation in various types of physical activity over the past seven days, including physical education classes, movement during breaks, after school, in the evenings and on weekends.

The use of the PAQ-A questionnaire provided objective information about the daily physical activity of adolescents, which is an essential addition to the results of physical tests and allows us to assess the overall effect of the ACTIVE NATION program on the formation of an active lifestyle during the school year.

The results of the PAQ-A questionnaire are presented in Table 3. Given the heterogeneity of the sample, accompanied by a high coefficient of variation ranging from 23.9 to 40.9% and non-compliance with the customary distribution law according to the Shapiro-Wilk criterion, all statistical data in the table are presented as the median, upper, and lower percentiles Me (25%; 75%).

An analysis of the results of physical activity among 13-year-olds using the PAQ-A questionnaire showed positive dynamics under the influence of the ACTIVE NATION program. The most significant changes were recorded in areas related to extracurricular activities. In particular, there was a substantial increase in indicators characterizing participation in sports activities during free time by 33.3%, with $p < 0.05$, physical activity during non-school hours by 33.3%, with $p < 0.05$, in the evening by 50.0%, with $p < 0.01$, and on weekends by

Table 3

Comparison of physical activity results in 13-year-old adolescents under the influence of the ACTIVE NATION program, based on PAQ-A (n = 34)

Measured indicators	Before intervention, Median (25%; 75%)	After intervention, Median (25%; 75%)	Z	r	p
Q1. Spare-time activity: sports	3.0 (2.0; 4.0)	4.0 (3.0; 5.0) *	2.08	0.36	0.03
Q2. Activity during physical education classes	4.0 (2.0; 4.0)	4.0 (3.0; 5.0)	0.09	0.02	1.00
Q3. Lunchtime activity	2.0 (2.0; 4.0)	3.0 (3.0; 5.0) **	3.25	0.56	0.001
Q4. After-school activity	3.0 (2.0; 4.0)	4.0 (3.0; 5.0) *	3.36	0.58	0.02
Q5. Evening activity	2.0 (1.0; 3.0)	3.0 (3.0; 4.0) **	4.22	0.72	0.001
Q6. Weekend activity	2.0 (2.0; 3.0)	3.0 (2.0; 4.0) **	4.26	0.73	0.001
Q7. Activity frequency during the last 7 days	3.0 (2.0; 4.0)	4.0 (3.0; 5.0) *	2.19	0.38	0.02
Q8. Activity frequency during each day last week	3.0 (2.0; 4.0)	4.0 (3.0; 4.0) *	2.03	0.35	0.03

Note: Z – standardized Wilcoxon test statistic; r – effect size coefficient. * The difference is statistically significant at $p<0,05$; ** – at $p<0,001$ compared to the baseline results of the pedagogical experiment (using the non-parametric Wilcoxon signed-rank test for dependent samples).

50.0%, with $p < 0.01$. The results indicate an increase in the involvement of schoolchildren in systematic physical activity outside the educational process. This positive trend can be explained by the combination of interactive, game-based, and motivational components in the program. The introduction of outdoor activities, quests, sports, patriotic events and digital activities provided additional motivation for schoolchildren, influencing not only the increase in physical activity, but also greater interest.

Another significant result is a 50.0% increase in activity during lunch breaks, with $p < 0.01$, demonstrating increased students' physical activity in everyday school settings. Important positive changes were recorded in the frequency of physical activity during the last week, with a rise of 33.3%, with $p < 0.05$, and daily activity during this period increased by 33.3%, with $p < 0.05$, confirming an overall increase in the regularity of physical activity.

These results were achieved thanks to the program's motivational and supportive components, which included video messages from famous Ukrainian athletes, volunteers, and military personnel, as well as interviews with peers who demonstrated examples of overcoming difficulties through sports, which provided additional internal motivation for schoolchildren. The use of inspiring quotes and messages contributed to the formation of resilience, belief in one's own strengths, and understanding of the importance of physical activity as a component of a healthy and active lifestyle.

However, the indicator characterizing participation in physical education classes did not show statistically significant changes ($p > 0.05$), which can be explained by the fact that the ACTIVE NATION program was focused primarily on extracurricular activities, where students had more opportunities for independent physical activity.

It is also worth paying attention to the integral indicator of the level of physical activity, PAQ-A total, which reflects an overall increase in the result of 50.0% at $p < 0.05$ at the end of the pedagogical experiment, which indicates the undeniable effectiveness of the ACTIVE NATION program. For better perception, the results of the PAQ-A total indicator before and after the pedagogical experiment are presented in the form of a diagram in Figure 3.

The data obtained, presented as a median, show an apparent increase in activity levels after the educational experiment. While at the initial stage, the median results were 1.0–2.0 points on most days of the week, which corresponds to a low level of physical activity, after the program was implemented, they rose to a stable 3.0 points on all days. We observed the most pronounced positive changes on Thursday, Saturday, and Sunday, where the increase was 2 points, indicating a significant increase in the involvement of adolescents in physical activity even on weekends. It should be emphasized that the statistically significant ($p < 0.05$; $p < 0.01$) increase in the level of physical activity on weekends is due to the specific features of the ACTIVE NATION program. Various outdoor activities were included in the program structure, particularly in culture and leisure parks, which created additional incentives for adolescents to spend their free time actively.

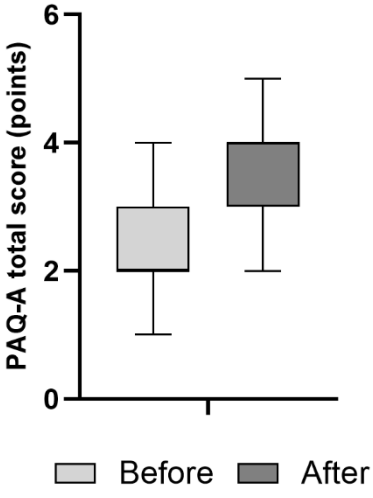

Fig. 3. Changes in the composite PAQ-A score in 13-year-old internally displaced schoolchildren before and after the pedagogical experiment. Data are presented as Me (25%; 75%), with the difference being statistically significant according to the non-parametric Wilcoxon signed-rank test for paired samples

The regular organization of sports competitions in various sports, relays, and quests on numerous topics with awards and valuable prizes and gifts for all participants contributed to increasing the involvement of schoolchildren in physical activity outside the educational process and stimulated the formation of positive motivation for exercise.

Overall, the increase in physical activity was about 50.0% on weekdays. Statistical analysis using the nonparametric Wilcoxon test for dependent samples confirmed a significant difference ($p < 0.05$; $p < 0.01$) between the results of the first and second stages of the study. The overall dynamics of the results confirm the effectiveness of the ACTIVE NATION program in forming regular and evenly distributed physical activity among schoolchildren throughout the week.

Thus, the study's results indicate the high effectiveness of the ACTIVE NATION program in shaping an active lifestyle for 13-year-old adolescents. Positive changes primarily concern an increase in the frequency and variety of physical activity among adolescents during non-school hours, creating conditions for reducing physical inactivity and improving health.

Discussion. The data obtained are consistent with the results of previous studies, which show that the integration of extracurricular activities and outdoor activities is an effective tool for increasing the overall level of physical activity among adolescents [2; 13; 15; 17; 43;]. Similar trends are described in the WHO recommendations, which emphasize the need to combine educational and physical activity to prevent physical inactivity in children and adolescents [24].

The ACTIVE NATION program has also confirmed the effectiveness of using multicomponent approaches that combine physical exercise, game forms, and informational and motivational elements [11; 14; 33; 36; 42]. Research shows that the systematic involvement of schoolchildren in organized forms of leisure not only increases quantitative indicators of activity but also forms lasting habits of a healthy lifestyle. Increasing activity levels on weekends is particularly valuable, as this period is typically characterized by low physical activity among children and adolescents [39].

However, the study has certain limitations. First, the sample covered only one age group and a limited region, which reduces the possibility of generalizing the results. Second, the use of the PAQ-A questionnaire, although a validated tool, involves self-assessment by respondents, which may be accompanied by subjective errors [32; 44].

Recent studies among adolescents displaced from their homes suggest physical activity provides physical benefits and crucial emotional support during crises [15; 19; 22]. Additional studies underline that family, school, and community factors strongly influence adolescents' levels of physical activity [27], compatible with our findings and suggesting that specific martial law settings may modify these effects.

Evaluating the effectiveness of a structured physical activity program under martial law, this study addresses a context that is rarely considered in international research. In contrast to previous studies [1; 8; 30] conducted in stable settings, our results reveal the specific challenges and coping mechanisms of displaced schoolchildren, who are constantly exposed to chronic stress and limited social opportunities.

Additionally, the study's uniqueness is due to the specific context of martial law, which includes constant air raids and limited access to sports facilities. These circumstances point to the pressing need for tailored programs to enhance physical activity in adolescents.

Despite this, a number of methodological and contextual limitations should be acknowledged when interpreting the findings. The sample size was relatively small ($n = 34$) and included only male displaced schoolchildren, which reduces the generalizability of the results, but at the same time gives the work a uniqueness, as it concerns a highly vulnerable and understudied group. The "before-after" design without a control group limits the ability to attribute the observed changes to the ACTIVE NATION program fully, but the studies remain conclusive due to statistical processing: the effectiveness of the program was confirmed by non-parametric criteria, in particular the Wilcoxon test for dependent samples, as well as by calculating the effect coefficient r to assess the strength of the effect.

Conclusions. According to the results of the pedagogical experiment conducted during the school year, the ACTIVE NATION program, developed for 13-year-old children under martial law, demonstrated promising results. The program, implemented in an extracurricular mixed format, provided a comprehensive improvement in the level of development of basic physical skills of 13-year-old displaced schoolchildren, in particular in the 20-m Shuttle Run (+13.6%, $p<0.05$) and Shuttle Race 10 × 4 m (+5.8%, $p < 0.05$) tests using the ALPHA-Fitness method, as well as in the Flamingo Balance Test (+11.8%, $p < 0.001$), Sit-and-reach (+14.3%, $p < 0.001$) and Standing Broad Jump (+8.1%, $p < 0.05$) indicators using the EUROFIT battery. This confirms the positive impact of the program on the endurance, balance, flexibility and speed-strength qualities of schoolchildren.

Statistical analysis using the Wilcoxon test revealed significant ($p < 0.05$; $p < 0.001$) positive changes in key motor skills, such as endurance, coordination and flexibility.

At the same time, the PAQ-A questionnaire confirmed a significant increase ($p < 0.05$; $p < 0.001$) in the level of daily motor activity of adolescents, especially after school hours and on weekends. The dynamics of the results indicate the successful integration of physical activity into everyday life.

Thus, the results obtained indicate the potential feasibility of implementing such comprehensive programs. They are promising, as they meet the modern challenges and needs of adolescents in crisis conditions, indicating a possible positive impact on both the development of motor skills and the encouragement of constant physical activity.

Acknowledgements. The authors would like to express their sincere gratitude to all participants for their voluntary cooperation and to Yuriy Fedkovych Chernivtsi National University for its institutional support.

Financing. The study was conducted in accordance with the research work of Yuriy Fedkovych Chernivtsi National University "ACTIVE NATION: a Modern Model of Increasing the Level of Physical Activity of Schoolchildren as a Strategic Element of the State's Defense Capability" (2024–2026). State registration number: 0124U000877.

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Прийнято до публікації: 20.11.2025
Опубліковано: 31.12.2025
Accepted for publication on: 20.11.2025
Published on: 31.12.2025