



The Effect of Chess Training and Well-Being Workshops on Vulnerable Children: A Dual Assessment of Cognitive and Emotional Growth

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Abstract: *This study followed the evolution of the cognitive and psychological performance of a group of 45 subjects from three localities (Romanesti, Dranceni, and Târgu Frumos) during an intervention program carried out for six months. The programme included chess activities and workshops to improve well-being, with the aim of analysing significant changes at the level of five parameters: chess test, chess rating, chess relative value, self-esteem, and perceived stress. The results obtained highlight statistically significant improvements in all five variables studied, indicating an increase in cognitive performance and chess skills, as well as a decrease in the level of perceived stress, along with a strengthening of self-esteem. The comparative analysis between the initial and final values suggests the effectiveness of the activities implemented within this intervention plan, highlighting the positive impact of chess and well-being-centered approaches on the cognitive and psychological development of the participants. These results support the integration of chess and wellness-oriented workshops into educational and personal development programs, with the potential to improve cognitive performance and reduce stress among young people.*

Keywords: *psychomotor intervention; childhood; primary school childhood; psychomotor development.*

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1. Introduction

In recent years, the Romanian educational system has been going through a transition period in which the demands of society seem to be moving away from the educational offer at an accelerated pace. The problem of school dropout can be explained by the fact that students from disadvantaged backgrounds do not perceive the completion of studies as a certainty for the beginning of a career. Thus, they choose to enter the labor market much too early, to the detriment of continuing their studies which implicitly leads to school dropout. Solving this problem has turned into a battle that seems far from over, and in order to understand its evolution, especially in the context of the digital age in which we find ourselves, we will present two areas that we believe can positively influence the teaching path of children from disadvantaged backgrounds, namely: *well-being* and *chess*.

Well-being, a concept that has taken many forms and has been integrated into various fields such as philosophy, psychology, sociology, or even economics, is the basis of the learning process through which the human species evolves. The "duty to be happy" (Aristotle, 1988) urges us to move beyond material desires and live a rational life. This approach involves an intrinsic motivation that transcends the instinctive impulse, but which contextually is complicated to appear, especially in children who come from disadvantaged backgrounds. Thus, creating an environment that preserves the principles expounded by Aristotle, gravitating around an educational activity, the study of chess, can be decisive in improving well-being.

The student's well-being is influenced by a variety of factors, both stressors and perceived resources, that interact with the educational environment. In this context, chess proves to be a valuable educational tool that contributes significantly to the students' personal and social development, while also improving their school results.

The demands of chess activity within the support community develop passion and hobbies. The volume of study and practice associated with chess may require additional dedication; However, this work contributes to the development of cognitive skills, forming a lifestyle based on inner discipline and effort for growth. The expectations of achieving good results can be seen not only as stress but also as an opportunity to learn discipline and concentration. Anderson, in his book "The Mastery of Learning," talks about how those with a growth mindset view competition. The prospects of this mindset allow them to view opponents not as a threat, but as partners who help them develop and achieve better results.

The climate of psychological safety plays an essential role. The students' perception that their emotional needs are accepted and understood by adults (teachers and parents) contributes significantly to this safety. When students feel supported and protected, they are more likely to take risks and express themselves freely. Fairness is also crucial; students' perception of evaluations in chess competitions gives them confidence and motivates them to get actively involved. A climate of fairness, in which they are fairly assessed, fosters healthy competitiveness.

When we are under tension and stress, our brain does not function optimally, mainly activating the amygdala, a brain structure located at the base of the brain. It acts as a rapid detector, integrating the information received through the senses (sight, smell, hearing, taste, palpation) and evaluating it to determine whether it poses a threat or not. The amygdala has a rapid connection to the thalamus, which makes reactions unconscious. The amygdala is an integral part of the limbic system and has important roles in processing emotions, the best-known being fear control. When we are exposed to a stimulus, the amygdala evaluates its emotional significance, determining whether the information is insignificant or deserves an emotional reaction. In this context, it is relevant to ask ourselves what implications the amygdala's activation has for the learning process. When a student feels "in danger" at school, his cortex is taken out of the game, and the amygdala will activate one of three reactions: "Wait!", "Attack!" or "Run!". This means that during class time, our work as teachers risks being in vain because the students will be more concerned with safety than learning. The perceived danger is often emotional and is intensely experienced by the student, without anyone from the outside noticing. To ensure that

students are in the best conditions to actively participate in the educational process, it is important to create an environment that supports their well-being. This includes ensuring their full presence, well-being, and curiosity necessary for effective learning. In the course of classes, it is essential to monitor the dynamics of the classroom and the fluidity of the transfer of information, using a language adapted to the students' level of understanding. It is crucial to ensure that all students understand and can correctly apply the information submitted. A student-centered approach, respecting their needs and emotions, contributes significantly to creating a climate of psychological safety, which not only facilitates learning but also improves overall well-being. Therefore, student well-being is not just an abstract concept but a practical and essential aspect of education. By carefully addressing students' emotional and cognitive needs, we can maximise their potential, both personally and academically. Thus, ensuring a healthy educational environment contributes not only to the development of students as individuals but also to the formation of a solid and integrated educational community.

In the last decade, the number of scientific research on the game of chess has increased significantly compared to the previous period. In addition to this increased interest, it should be noted that the fields from which they come are varied, for example:

Chess and artificial intelligence – are somehow two similar directions, the first dedicated to engines and their evolution and the second dedicated to neural networks for a deeper understanding of the game. After Deep Blue managed to defeat Kasparov in 1997 in the rematch (Kasparov, 2008), the rise of the engines was meteoric, and today a man vs machine match is irrelevant. The evolution of engines and their matches changed the way grandmasters perceived the game of chess, and many of the principles on which their game was based became null and void. With the help of AI, the value of chess pieces, which until recently was unanimously accepted in the form (King, Queen, Rook, Bishop, Knight, Pawn) = (∞ , 9, 5, 3, 3, 1) has undergone significant adjustments, (King, Queen, Rook, Bishop, Knight, Pawn) = (∞ , 8.9, 4.6, 3.3, 3, 1) or (King, Queen, Rook, Bishop, Knight, Pawn) = (∞ , 9.82, 4.93, 3.28, 3.16, 1) (Grupta et al., 2023).

Chess and education – The educational benefits of chess have been examined since 1973-1974 through the studies of Dr. Frank (Frank & D'Hondt, 1979), which were later developed by Gonzalez (1989), Ferguson (1983; 1988), Margulies (1992) and later by Gobet (Gobet & Simon, 1996; Gobet & Campitelli, 2006, 2008, 2011). The perception of a chess game's importance for personal and academic development helps students to be more motivated. Understanding the role chess plays in developing strategic skills and critical thinking gives meaning to their educational activities. Constructive feedback from coaches and peers contributes to continuous learning, and moral support helps students understand their progress. This supportive atmosphere created by coaches and colleagues is essential for improving school performance.

Chess and psychology – the scope of research in this field varies enormously, but we want to mention a few of them: observing the neurological effects of practicing chess (Franklin et al., 2020; Wessel & Aciego, 2017; Ortiz et al., 2019), the way players think under time pressure (van Harreveld, Wagenmakers, & van der Maas, 2007), the link between intelligence and chess (De Bruin et al., 2014; Grabner, 2014; Aciego, García, & Betancort, 2012; Bilalic, McLeod, & Gobet, 2007; Grau-Pérez & Moreira, 2017; Mirzakhanyan, Gevorgyan, & Khachatryan, 2016; Sala et al., 2017), attention distribution (Krawczyk et al., 2011; Velea & Cojocaru, 2018; Stegariu et al., 2020; Louedec et al., 2019), thinking (Saariluoma, 2001; Förster, Friedman, & Liberman, 2004) and creativity (Gliga & Flesner, 2014; Sigirtmac, 2016). Autonomy is another important aspect. In a competitive environment, students have the opportunity to organise their preparation and strategic choices, which contributes to the development of a sense of control over their development. This allows them to experience individuality and learn from their own experience. Active participation allows students to get involved in decisions that concern them, helping them to feel an integral part of the community.

Chess and sport – Due to the common elements and some empirical accidental discoveries (in the world title matches, the two opponents lost significant weight) several authors have tried to justify the fact that the game of chess is a sport. Golf (2015) analysed the biochemical and psychological aspects of the chess game, and other authors evaluated the psychomotor behaviours of people who practice chess. Stegariu followed the evolution of the body schema (Stegariu, Abalasei, & Stoica, 2022), and of the spatial orientation (Stegariu et al., 2023), and Garcia (Garcia et al., 2019) observed the changes in heart rate in the context of problem-solving. Taborda Saldarriaga (2013) sought to integrate chess into physical education and sports classes. The competitive environment of chess offers numerous opportunities to develop one's skills. Participation in competitions and constant training contribute to improving critical thinking and problem-solving skills, which are essential for school success. Supportive relationships and appreciation from colleagues encourage a climate of collaboration. Students who feel supported by their community are more likely to adopt a positive attitude towards learning and competition.

Chess and Therapy – Chess practice has been associated with various therapeutic interventions, especially in relieving the symptoms of children with ADHD. Blasco-Fontecilla (Blasco-Fontecilla et al., 2016) created a chess training program for a group of 44 children who were diagnosed with ADHD, and the results were significant as in Eldaou & El-Shamieh's case (2015). Another interesting perspective is that presented by Crespo et al. (2019) in which practicing chess can prevent the onset of dementia. These studies are the foundation of a new direction of research that is worth addressing given the evolution of technology and the increase in the number of people suffering from depression.

These four directions are not the only ones, but we believe that they try to outline the most important valences of the chess game. In conclusion, the integration of chess into education not only promotes the well-being of students but also contributes to the formation of informed and integrated citizens, capable of adapting to an ever-changing world. It is essential to invest in the development of this chess community and encourage the participation of young people in order to provide them with a conducive environment in which they can explore their full potential. Thus, chess proves to be not just a game, but a catalyst for personal growth and success, supporting students on their journey to become autonomous and well-adjusted individuals.

To understand how practicing chess promotes the improvement of psychological skills such as perceived stress or self-esteem, it is enough to observe the fundamental operations of thinking: *analysis, synthesis, comparison, abstraction, generalisation, and concretisation*. *Analysis* involves breaking down a phenomenon into simple elements that can be assimilated, and this process can also be used in stressful situations to generate a rational response. *Synthesis and comparison* integrate the particular situation in which the individual finds themselves into a well-established framework where the way to react is accessible and performed with confidence.

Moreover, children who practice chess are required to alternate between the last three processes, *abstraction, generalisation, and concretisation*, to uncover the specific features of each position in relation to general principles. This alternation provides context and clarity in the most challenging positions, and the approach can be translated into everyday life.

In conclusion, the requirements imposed by the simple rules of chess *compel* students to develop an efficient thinking mechanism that has visible effects on improving psychological skills, such as perceived stress or self-esteem.

2. Material and Methods

The aim of this study was to observe the evolution of *chess* and the *well-being* of a group of pupils participating in a project entitled *Chess for Well-Being*. By measuring chess skills and well-being, we set out to observe to what extent practicing chess can represent a complementary alternative to school activities to enhance the learning process in children who come from disadvantaged backgrounds – visually impaired, foster care, and vulnerable families. To assess the

difference between baseline and final values, we used a Paired samples t-test together with Cohen's d. Pearson correlation was used to observe whether there is a connection between chess evolution and well-being, and linear regression was used to find out to what extent chess evolution can be considered a predictor of well-being.

The research subjects come from three different backgrounds: Românești, Târgu Frumos from Iași County, and Drănceni from Vaslui County. 15 students, of which 9 in foster care are enrolled at the Ioanid Romanescu Secondary School in Românești, the youngest being in the second grade, and the oldest in the eighth grade. 10 students from the Moldova Special High School in Târgu Frumos with visual impairments make up the second group, and their age ranges from 8 to 17 years old. The last group, the most numerous, consists of 20 students from Drănceni, Vaslui County who come from vulnerable families. In total, 45 students from 3 localities participated in the same chess activity plan.

Project *Chess for Well-Being* (<https://www.facebook.com/SahpentruStaredeBine/>) is carried out by the Pionii Regelui Sports Club Association and the Moldova Special High School in Târgu Frumos in partnership with the Gambit Huși Chess Club Association, financed through the In Condition of Well (www.instaredebine.ro), supported by Kaufland Romania and implemented by Civil Society Development Foundation. The implementation period is 6 months, from 15.07.2024 to 14.01.2025, and the research subjects were tested initially in the first week of the training plan and finally in the last.

The test battery has 2 components: measurement *level of well-being* and *chess skills*. *Chess testing* quantified the ability to solve problems (puzzles) and the level of play. The students had to solve 20 problems with a difficulty ranging from checkmate positions in one move to checkmate positions in 3 moves. The working time was 30 minutes and they were able to distribute as they pleased. To measure the chess level we used the platform www.lichess.org on which we created a new account for each topic. They played 5 games of rapid chess (10 minutes) that significantly influenced their rating. To understand how to calculate the relative value (playing strength) of a chess player, we recommend consulting Glickman (1995) and Elo & Sloan (1978). The number of problems solved and the rating obtained were included in a mathematical formula that quantified *Relative chess value*:

$$V = \omega_1 \frac{R-200}{2000} + \omega_2 \frac{S-1}{19}$$

Where:

V – chess value;

ω_1 - rating weight (= 0.7);

ω_2 – test result weight (= 0.3);

S – test result;

R – lichess rating;

For testing the level of *well-being*, we used a protocol that contained 2 questionnaires:

1. Rosenberg Scale – the test for assessing self-esteem;
2. The Perceived Stress Scale developed by Cohen & Williamson.

1. The Rosenberg Scale aims to indicate the level of self-esteem through a simple and easy-to-apply tool. It was patented by Morris Rosenberg in 1965 and was originally intended to measure the overall sense of self-worth and self-acceptance but is currently used to know the level of self-esteem in children and adolescents. The questionnaire includes 10 items for which respondents must choose a variant from: *total agreement*, *agreement*, *disagreement*, and *total disagreement*, and their rating is numerically from 1 to 4 points. In the case of items 2, 5, 6, 8, and 9, the rating is done the other way around, so the final scores can be between 10 and 40. Values between 10 and 20 points indicate low self-esteem, between 20 and 30 an average self-esteem, and between 30 and 40 an increased self-esteem.

2. The perceived stress scale has the role of assessing the level of stress felt by each respondent in terms of the subjective evaluation of the situations in which they find themselves. Respondents are asked to be honest and explain that honest answers to events over the past month will provide a real picture of perceived stress. The answers are on a scale of 0-4 where 0 never represents, and 4 very often. Out of the 14 questions, 7 have reversed scores due to the positive connotation of the questions.

The interpretation of the results proposes a classification of the score obtained into 3 categories:

1. Low-stress level;
2. Moderate stress level;
3. High-stress level.

The activity plan was established by the coaching team of the two chess clubs, King's Pawns, and Gambit Huși together with the team of psychologists from the Moldova Special High School and included:

1. Weekly workshops – held at the headquarters of each institution involved in the project. There were 15 of them and consisted of individual study (problem-solving), presentation of content on the demonstration board, and thematic games. The workshops lasted between 1h30' and 2h30' conditioned by the content of the lessons.

2. Demonstration lessons – 3 demonstration lessons in which all the research subjects participated, along with other interested students from the host institution. The students were divided into two equal groups according to age, but students from each community were compulsorily found in each group. Half of them went through a workshop designed to understand the concept of *well-being* coordinated by the team of specialists of the Special High School Moldova, and the others participated in a presentation of chess concepts. After the end of this part, the groups changed activities as follows, all subjects attended a workshop for well-being and a *chess presentation*. The lesson ended with a chess tournament entitled *Pawns Tournament: Competition for Well-Being and Social Inclusion (total 3 editions)*. The first lesson took place in Românești on 14.09.2024, the second in Huși on 05.10.2024, and the last in Târgu Frumos on 02.11.2024.

3. Educational camp in Putna – Between 22-26.08.2024, the educational camp organized at the Sihăstria Putna Monastery was held, in which all the research subjects participated. This was carried out at the beginning of the activities because the main objective was to homogenise the group and to get to know the actors involved, students, teachers, volunteers, and accompanying parents. The program of activities of the camp was as follows:

Day 1: Team building and knowledge activities;

Day 2: Psychological testing of students, reading session, nature hike and chess training;

Day 3: Participation in the *Pawn Tournament: Competition for Well-Being, first edition* and team games;

Day 4: Two chess practices, two reading sessions, and visiting the Putna Monastery;

Day 5: Closing ceremony and handing over of certificates of participation.

4. Chess tournament in Românești – *Pawns Tournament: Competition for Well-Being and Social Inclusion – the fourth edition* took place in Românești on 12.10 and was attended by 93 students. The tournament was played in the Swiss system, 7 rounds, and the awarding was made according to several age categories and gender. The main purpose of the tournament was to verify the knowledge gained at the weekly workshops, at the demonstration lessons (2 out of 3), and in the camp. The outcome generated a clear hierarchy of students over which the coaches had no influence. The knowledge check was validated by the individual results recorded.

The statistics were mainly made with the help of Microsoft Excel, but some data was analyzed in IBM SPSS Statistics 20 software.

3. Results

After applying the evaluation protocol, the students recorded the following results:

Table 1. Descriptive statistics.

		N	Min	Max	Mean	Std. Dev.
Chess test	Initially	45	1	16.50	6.13	4.126
	Final		5.50	19.00	11.92	4.002
Rating	Initially		400	1713	904.11	331.759
	Final		625	1987	1079.49	304.972
Chess value	Initially		0.048	0.720	0.295	0.188
	Final		0.257	0.913	0.534	0.180
Perceived Stress	Initially		55	79	66.98	6.002
	Final		54	79	63.47	5.845
Self-esteem	Initially		20	29	24.33	1.989
	Final		22	32	27.11	2.197

The results of the chess test suggest a considerable improvement (6.13 -> 11.92), and the dispersion of the results indicates a consistency of variability. In the case of the rating, the final data are more homogeneous than the initial ones (304,972 compared to 331,759). The chess value and perceived stress retain the same pattern as the chess test, and the dispersion of the final values of self-esteem suggests a slight increase.

To highlight the progress on each measured indicator we performed the paired sample t-test, and the results are shown in Table 2.

Table 2. Paired sample t-test.

Tests	N	Correlation	t	p	Cohen's d
Chess test	45	0.553	10.102	0.000	1.424
Rating		0.470	3.580	0.001	0.550
Chess value		0.676	10.821	0.000	1.300
Perceived Stress		0.866	-7.511	0.000	-0.592
Self-esteem		0.449	8.454	0.000	1.325

In the case of the Romanian group, the participants who had a significant increase in self-esteem did not necessarily have a decrease in stress levels and vice versa. This suggests that individual responses to the intervention can vary significantly. For example, the P.G.A. subject increased in self-esteem (3 points) and had a stress reduction (4 points). In the Drănceni group, in many cases, participants who experienced an increase in self-esteem also had a decrease in stress, suggesting a positive relationship between the two variables. For example, S.D.S. increased self-esteem by 4 points and had a 7-point reduction in stress, which illustrates the benefits of the intervention. In the Târgu Frumos group, the program had a significant impact on self-esteem and stress levels for most participants, showing the effectiveness of the intervention in improving general well-being. Globally, we see that each measured indicator had a statistically significantly better result than the initial one. Due to the positive results, considering expanding the program with additional activities that specifically address the needs of students with visual impairments can lead to an even greater improvement.

An analysis of the results of each measurement provides some interesting insights that can be the foundation for future research. On the chess test, the relative value and self-esteem index **Cohen's d** It has a value that is close to 1.5, thus, the overlap of the distributions is zero, which indicates impressive progress. This result indicates that in the case of the initial test, we had a group of beginner subjects with a low level of self-esteem. In the case of the final test the subjects

behaved like professional chess players, who implicitly also have an increased self-esteem. In the case of the other two tests, Cohen's rating and perceived stress index indicate an average effect of superiority.

Of the 5 tests, the results of perceived stress are the only ones that strongly correlate (0.866), so we can talk about an improvement in most children. The relative value has an average-good correlation (0.676), a result that attests to the efficiency of the chess program. In the case of the other 3 tests, chess test, rating, and self-esteem, the correlation is moderately positive (approx. 0.500). The final results tend to increase, but not in a perfectly linear way, and this, correlated with the significance of the t-test, justifies the children's progress, both in chess and psychological skills.

We tried to find out if chess practice, measured by the evolution of relative value, is a predictor of self-esteem or perceived stress, and to show this we performed a linear regression. The results can be seen in Table 3.

Table 3. Regression statistics.

Relationship	Multiple R	R2	Std. Er.	p-Value	Observations
Chess - Perceived Stress	0.027	0.00	5.913	0.861	45
Chess - Self-esteem	0.181	0.03	2.185	0.231	

The results of linear regression are not statistically significant, and this indicates that chess practice, in the case of the social context in which the subjects of this study find themselves, cannot be considered a predictor of self-esteem or perceived stress. Given the difficult conditions in which they are forced to live, other elements of their lives play a more important role in the formation and development of psychological skills, than practicing chess.

4. Discussion

This study investigated the evolution of a group of 45 students from disadvantaged backgrounds, such as foster care, vulnerable families, and visually impaired (amblyopia). The children went through a 5-month chess program consisting of an educational camp, weekly chess workshops, demonstration lessons, chess tournaments, and wellness workshops. We quantified chess progress and the level of well-being through a battery of tests that were applied initially and at the end of the project. The link between chess progress and well-being has not been observed before, although much research has focused on certain psychological skills such as critical thinking (Trincheró & Sala, 2016; Trincheró, 2013; Subia et al., 2019), necessary in solving mathematical problems, creative thinking (Sigirtmac, 2016), focused attention (Iz et al., 2019), capacity for verbal abstraction, resistance to distraction, perceptive organisation (Aciego, García, & Betancort, 2012) and impulsivity (Afshari, Majidi, & Yadolahzadeh, 2022).

I discovered that, at the beginner level, in order to progress in chess, specific training must focus on two distinct directions: the accumulation of information and reactions in adverse conditions. Previous studies that have highlighted chess benefits have not used this approach. Work discipline and workshops to increase the level of well-being ensured active learning, an accumulation of conceptual information, and its assimilation. This approach is not complete because their display is done in conditions of adversity that the child cannot anticipate, due to the immeasurable nature of the game (Shannon, 1950; Steinerberger, 2015). Thus, the project also included 5 editions of *the Pawns Tournament: Competition for Well-Being and Social Inclusion*, held at regular intervals so that students had the opportunity to test the knowledge acquired. Each tournament had a specific goal: to objectively create hierarchies within the project, and these were of 3 kinds: at the group level, at the work point level, and individual. The reaction produced had a domino effect in the sense that it triggered a chain reaction starting from the place obtained in each tournament. The assimilated knowledge was subjected to a process of critical analysis that generated new particular forms, for example: The following sequence of moves appeared in several

games at each edition of the tournament:

1. e4-e5; 2. BC4-NC6; 3. Qf3-Nf6; 4. g4(diagram 1)-Bc5; 5. g5(Diagram 2)-00; 6. gxf6 or 5. ...-Ng8; 6. Qf7(Diagram 3)#



Figure 1. From left to right diagram 1-3

Black respected the most important principle of opening, *occupying the center, and developing the pieces*, while White broke several rules and made a few mistakes, but was not punished and managed to win the game. This example was a lesson for many students and showed the sport-specific side of chess, adversity. It is useless to respect the principles blindly if you do not adopt them, in the form of a reaction, to the opponent's decisions. Such situations have arisen especially in the games of diligent children played against the more impulsive and energetic ones who have a more independent character.

The workshops for well-being aimed at increasing the level of *emotional intelligence* and *self-esteem*. The main concepts around which the activities revolved are *gratitude, kindness and compassion, active listening, and self-perception*. Emmons (Emmons & McCullough, 2003) found that directing attention to the good things in your life at the expense of problems can have a positive impact on emotional intelligence. We have noticed the same effect; the children have realised how important it is to support parents and involve teachers in their teaching journey. This aspect was unknown and taken for granted, and the main change was felt in their resilience to perceive failures as a simple lesson that plays an important role in the development process. We can say that the *Gratitude Journal* that they held was a game changer that we recommend in this way to all teachers, coaches, and parents. People who manifest *pity* Both themselves and others are less likely to suffer from anxiety and depression (Gilbert, 2017). Practicing compassion for others also activates areas of the brain associated with positive emotions (Gilberts, 2017) which in turn generate oxytocin secretion. This chain phenomenon, along with the *Gratitude Journal*, transformed not only the way students perceived chess workshops but also the lessons in the school curriculum. The change was also noticed by the teachers in the classroom, 6 of the beneficiaries are colleagues, and at the classroom level the teaching activity has become efficient, and the teachers' explanations are connected with the way the students behave. I continued with *Active listening* because it comes as a complement to the other two concepts. *Empathy* and *Constructive language* are the elements that underpin active listening and lead to the construction of healthy relationships based on *gratitude* and respect. Marshall (Rosenberg, 2015) observed that in human evolution this type of communication has promoted cooperation and reduced the number of conflicts. We have come to the same conclusion, only through collaboration and the transformation of the perception from opponent to partner generates progress. Going back to the example in Figure 1, if we turn the game into a dialogue, and instead of perceiving the move g4 as aggression, we perceive it as advice, we realize that the result will generate progress. The student will learn to react correctly through a simple counterattack (4. ...-Nd4 or 5. ...-Nd4) thus, eliminating the anxiety states that can arise after such games. After participating in the workshops

on *gratitude, attentive obedience, kindness, and compassion*, we turned to *the perception of the self*. The main problem we wanted to address and intervene with was the difference between how the student is perceived by others and how he perceives himself. Higgins (Higgins, 1987) discovered that a significant difference between the real self and the ideal self can generate, in the first phase, sadness and shame, and later anxiety. Neff (2003) proposed the concept of self-compassion to combat the states described by Higgins. Self-compassion helps to improve one's self-image by accepting oneself, with all its flaws and limitations and helps to build a healthy relationship with oneself. Practicing chess can be brutal for children who are not gifted with cognitive abilities or have not lived in an environment that requires them. The fact that the project imposed a small circle of subjects, the change in the chess hierarchy occurred only in the case of those children who understood and accepted the psychological skills described above, because all students were exposed to the same chess content. Accepting limits facilitated the learning process, and with the passing of chess lessons, the difference in chess skills was significantly diminished.

The results suggest that the intervention had a significant effect on reducing stress levels. This is crucial, given that chronic stress can lead to more complex problems, including emotional and behavioural disorders in children. Participants began to develop more effective coping mechanisms, both problem-oriented (e.g., solution-seeking) and emotion-oriented (e.g., expressing emotions). The observed increases in self-esteem indicate an improvement in self-assessment and self-confidence, which is fundamental in managing stressful situations. Higher self-esteem allows participants to approach challenges with a more positive attitude. High and stable self-esteem can support participants in coping with difficulties and improving their performance in social and educational settings. Many of the people who experienced significant decreases in stress also had increases in self-esteem, highlighting the two-way relationship between these two aspects. A good state of mental health facilitates the development of positive self-esteem and vice versa. The intervention project demonstrated that structured activities, such as chess and counselling, can have a significant impact on self-esteem and stress levels in children and adolescents. It emphasises the importance of social-emotional education programs in supporting the holistic development of young people, thus contributing to increased mental health and the prevention of long-term behavioral problems. By continuing and expanding these interventions, and providing ongoing and personalised support, a strong foundation can be created for a healthy and fulfilling future for all participants.

The results presented in Table 3 indicate that, for our group, there is no linear correlation between practicing chess and the level of perceived stress. The main reasons identified by the team of coaches and psychologists are related to the participants' backgrounds. Stress has multiple causes, including individual personality traits, emotional resources, and cognitive abilities, which together create highly diverse situations where chess practice produces unexpected and inconsistent outcomes.

Two cases merit discussion, the first example is that of C.T.M. (girl, 5th grade), who showed significant progress in self-esteem, increasing her score from 24 to 32. Although her initial score was below the group average, her final score was the highest recorded. Regarding chess ability, her initial performance was well above the group average (11th place) but her final position, despite significant improvement, was 28th out of 45. Her perceived stress level remained constant but both initial and final values ranked among the top three results in the group. Her progress illustrates the complexity of the situations encountered in this project.

The second case involves C.T.V. (boy, 5th grade), who demonstrated remarkable progress in reducing perceived stress, from 68 to 59. However, his self-esteem level remained constant and, unfortunately, was the lowest recorded both initially and at the end. A highly diligent student, he applied the same disciplined approach to chess. His final position ranked in the top half of the group, compared to his initial ranking of 40th out of 45.

These two examples provide context for the conclusion that practicing chess cannot be considered a reliable predictor of perceived stress levels or self-esteem, due to significant

individual variations.

It should be noted that this research has some limitations that must be taken into account when trying to duplicate the results. The first is given by a limited *number* of students. This was assumed out of the desire to provide quality in the act of teaching. The 45 children come from 3 different institutions, so 3 work points followed the same curriculum. The second is the *duration* training program which, although sufficient, we recommend to be at least one school year. If the chess program is successfully introduced within a school, more extensive and frequent testing can be carried out. The last limit is given by the *environment of origin* of the beneficiaries. In our case, the unfortunate situation in which these children find themselves has guaranteed us their active presence, generated by an intrinsic motivation to self-improve.

After observing the limits of research, I found some future research directions that would be worth addressing. The first is the *scaling* program to a significantly larger number of subjects who also come from multiple educational institutions and family backgrounds. The second direction is related to *duration* Research. In the first phase, the extension to one year and later to an educational cycle. A longitudinal study would provide clear results and present the educational importance of chess activities. In this research, it would be interesting to observe a correlation between a child's school results and the relative value (rating).

More and more studies, a category to which ours adheres, focus on the multidimensional importance of chess. We firmly believe that practicing chess can be a complementary activity to school that will bring multiple benefits.

5. Conclusions

The need for extracurricular activities is felt more and more strongly due to the evolution of technology that provides a pleasant and attractive dopamine-generating environment. School lessons are becoming more and more boring, access to scientifically validated information is increasingly easier, and students' involvement in the teaching act is increasingly absent.

The escape from everyday life, which offers uncomfortable situations, into the virtual one creates an initial state of well-being followed by an incomprehensible anxiety. The need to adapt the school curriculum is an important topic that has not received enough attention, and the COVID-19 pandemic has forcibly introduced technology into the educational act.

Practicing a sport is a compromise solution, at least until an eventual reform of the educational system that will produce the necessary changes to adapt the content, methods, and means to the demands of society. By practicing chess in an organised environment and in a diversified way, through lessons, tournaments, camps, and psychological workshops, the problems stated above are mitigated. We have concluded that this program is only the beginning, and the family and school environment must promote the same principles and values in order to have the desired result.

Our training program has significantly improved the student's chess skills, both at the level of accumulated knowledge and at the level of playing strength (rating). Also, the psychological workshops enhanced the knowledge of oneself and the relationships with those around them, which, together with the chess program, increased the level of well-being of the beneficiaries.

We strongly recommend the creation of a school-level chess club that is made up of several groups, created according to chess skills and age. In addition to chess lessons, either the classroom teacher or coach, or the psychologist who works in the school as a school counselor, must coordinate at least once every 2 chess lessons a workshop on certain psychological concepts. The results obtained put us in a position to recommend the workshops carried out within the project, but if the club's activity will exceed half a school year, then the skills of the school psychologist are sufficient to plan the theme of the following activities. The process of integrating chess into schools is addressed by the National Program "Education through Chess," coordinated by the Romanian Chess Federation in collaboration with the Ministry of Education and the Ialomița Teacher Training

Center. The program is accredited under Ministerial Order No. 6426 of 19.12.2022, for a period of four years. We strongly recommend their approach with a small amendment, the inclusion of workshops for well-being.

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