

DOES PLAYING CHESS STRENGTHEN RESILIENCE?

Zoltán MEDVEGY^{1*}, Máté MIHALOVITS², Mihály MEDVEGY³,
Imre ZABOS³, Tamás STERBENZ¹

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ABSTRACT. Previous studies show that physical sports strengthen the psychological immunity, namely the resilience. In our research, we sought to answer the question of whether the above statement was also true for chess, one of the most popular mind sports. The aim of our study is to find correlations between resilience and chess, especially in its competitive form. The American Psychological Association (APA) summarizes the behavior and lifestyle requirements to build resilience in ten points. We used a questionnaire to quantify the level of resilience in persons participating in the research. We divided the participants (396 persons) into three groups based on their chess experience: tournament players, hobby players, and non-players as a control group. We compared the results of the groups in each requirement listed by the APA. Chess players had better results in seven cases of the ten guideline points, while no correlation was found in three cases. Chess competitors are more likely able to accept crises and situations that cannot be changed. They are more focused while pursuing their goals and are able to face and work through challenges more efficiently. They seek the reasons of their failures which helps them to improve their skills. Chess players also tend to maintain a healthier lifestyle. We conclude that chess, especially in its competitive form, can build resilience.

Keywords: chess, resilience, drawing consequences from failure.

¹ Hungarian University of Sports Science, Budapest, Hungary

² University of Technology and Economics, Budapest, Hungary

³ Flór Ferenc Hospital, Kistarcsa, Hungary

* Corresponding author: zmedvegy@hotmail.hu

Introduction

It is well known that physical activity has great importance in maintenance and improvement of health and helps to cope with diseases and their complications. As an example, controlled, regular exercise has a basic role in the therapy of obesity and carbohydrate and lipid metabolic disorders in developed countries. Moreover, sport has favorable psychological effects as well. It contributes to health awareness, youthfulness, makes one feel fit, helps develop regularity and increases the ability to define priorities. Stamina, need for development, aspiration for victory in a fair competition and enjoying success are all parts of sport.

Chess is one of the oldest mind sports and the aforementioned favorable psychological effects of physical activity are true for chess as well. Previous research suggests that chess develops cognitive skills (Fotinica & Petru, 2014), influences persistent attention, concentration, auditory memory function (Fattahi et al., 2015), creativity (Joseph et al., 2016), contrivance ‘thinking’ in general, mathematical and logical abilities (e.g., Medvegy et al., 2018; Gobet, 2018). Hence, it is worth beginning playing chess as early as possible (Aciego et al., 2013). In recognition of this fact, the European Parliament issued a declaration about supporting the introduction of chess into education (Strasbourg, 2012). It made it possible to include chess in the curriculum in several countries.

But does chess have any further advantages apart from those mentioned above? Besides use of cognitive skills, is there any other difference in personality between those who play chess and those who do not? Does chess affect maintenance and development of – both physical and mental – health? We answer these questions through the examination of resilience.

Resilience is a psychological concept which means coping skills, flexibility, ability of adapting in the face of stress and hardships of life and getting on well in life (Masten & Reed, 2002). Resilience helps us to avoid nervous breakdowns caused by stressful events (Zautra et al., 2010), therefore, it has been studied extensively by scientists. Resilience is the ability to mentally or emotionally cope with a crisis or to return to pre-crisis status quickly (*de Terte* & Stephens, 2014). It is generally a ‘positive adaptation’ after a stressful or adverse situation (Hopf, 2010). When someone is constantly under stress, it disrupts the internal and external sense of balance, presenting challenges as well as opportunities. The routine stressors of daily life can have positive impacts which promote resilience. Some people can handle greater amounts of stress than others (Oláh, 2004). Stress is experienced in an individual's life course at times of difficult life transitions, involving developmental and social change; traumatic life events, including grief and loss; and environmental pressures, encompassing poverty

and community violence (*Kemp et al., 1997*). The Children's Institute of the University of Rochester explains that 'resilience research is focused on studying those who engage in life with hope and humor despite devastating losses' (Pedro-Carroll, 2005). Resilience allows a person to rebound from adversity as a strengthened and more resourceful person (Richardson, 2002). When an event is appraised as comprehensible (predictable), manageable (controllable), and somehow meaningful (explainable) a resilient response is more likely (Carr, 2004). Resilience has several interrelated components. Improvement of resilience is possible and necessary.

The American Psychological Association (APA) recommends a ten-point list for building and improving resilience (APA, 2016). It suggests that these measures are effective either separately or – especially – together. The essence of these points is the following:

- 1) Make good connections with family members and friends.
- 2) Avoid seeing crises as insurmountable problems.
- 3) Accept situations as they are (even when they are unchangeable).
- 4) Move toward your realistic goals.
- 5) Take decisive actions.
- 6) Look for opportunities for self-discovery.
- 7) Nurture a positive view of yourself.
- 8) Keep things in perspective.
- 9) Maintain a hopeful outlook.
- 10) Take care of yourself.

Several studies have found that there is a positive correlation between physical sports and resilience (e.g., Hosseini, 2010). Christopher Bryan analyzed the current knowledge of sport and resilience (a total of 64 articles) and bridged the gap between the work and sport psychology to develop a unified understanding of this concept (Bryan, 2017). The relation between sports and resilience is reciprocal: physical sports have beneficial effects on resilience and more resilient athletes perform better in sports (Chacón-Cuberos et al., 2019).

One may ask whether physical activity or other factors from competitive sports tend to strengthen resilience. We can get an answer to this question through the study of the possible correlation between mind sports and resilience. In case of correlation, we could conclude that not only physical activity but also other factors associated with mind sports would be related to resilience.

Correlation between chess and resilience has already been claimed. Mangesh (2015) explained the resilience through a common chess opening, namely the Ruy Lopez. The reigning world champion Magnus Carlsen presents 10 effects of chess in his blog which help develop resilience. He points out that chess helps accept new situations and makes connections even between those who do

not share a common language, teaches how to draw consequences from failures, helps to recognize hardships, teaches how to follow rules, create safe 'state' and accept actual balance of power (Play Magnus, 2018). Hymer (2021) described the role of resilience in chess achievements. For example, the world champion Magnus Carlsen demonstrates his ability of bouncing back: He scored 66% after a win, 60% after a draw, and a staggering 73% after a loss (Hymer, 2021).

Hymer (2021) made the following suggestions in order to become more resilient in chess:

- see resilience not as something you are, but as something you do
- change the self-talk record
- find a role model
- have a laugh about it
- keep good habits
- accept the hurt

It comes into view that these recommendations are in correlation with the suggestions of APA (APA, 2016). A successful chess player needs to take the most of these advices.

Hypotheses

Although the above-mentioned suggest that there is a clear link between resilience and competitive chess, we would like to support this prediction with research. The goal of our study is to find statistical correlations between chess and resilience, driving attention this way to the importance of playing chess. Our main hypothesis is that competitive chess players are more resilient than those who do not play chess. In other words, we predict that the responses of competitive chess players are more in line with the recommendations for strengthening resilience (APA, 2016) than non-chess players. Our sub hypotheses are that chess players are on a higher level of resilience in each particular point of the APA list mentioned above (APA, 2016).

Materials and methods

Sampling

We used stratified sampling method because we assumed that chess players were difficult to reach randomly within the population. We divided the target group into two main groups (chess players and non-players as a control group) and different sampling methods were used in each group. We used

snowball method when selected chess players and random selection when chose the control group. We found that there is a huge difference between chess players in whether they play chess competitively or at a hobby level so we divided the group into two. Finally, we got three groups which were well separable from each other: competitive players (have FIDE Elo-points), hobby players (play chess occasionally but don't have Elo-points) and non-players (cannot play chess or never play at all).

Participants

396 participants (268 men, 128 women; age: $M = 39$ years, $SD = 15$) took part in the study. The participants were divided into three groups based on their chess expertise. 197 FIDE-rated individuals (161 men, 36 women; age: $M = 36$ years, $SD = 15$) were placed into the group we called competitive players. 92 individuals (56 men, 36 women; age: $M = 40$ years, $SD = 14$) were placed into the group called hobby chess players. They were intellectual workers or students playing chess as a hobby but not in competitive form. 107 individuals (51 men, 56 women; age: $M = 45$ years, $SD = 14$) were placed into the group called non-players. They were intellectual workers or students who do not play chess.

In the groups of competitive and hobby chess players, the proportion of men and women differed significantly. This is explained by the fact that chess is much more popular among men than among women. The above statement is also supported by the fact that only ca. 40,000 of the ca. 246,000 chess players (that is 16%) on the FIDE Elo rating list are women.

Materials

An anonymous questionnaire was filled in by the participants. The questions were related to the resilience-improving suggestions (APA, 2016): Making connections, tolerating failure, seeking the cause of failure, ability to concentrate, purposefulness, self-knowledge, self-confidence, foresight, and healthy lifestyle.

Data Analyses

We evaluated the points of the questionnaire that showed correlation with improving resilience. We investigated self-evaluating questions on the Likert scale from 1 to 5 points (5 is best). We studied the distribution of points compared to each other at competitive chess players, hobby players and non-players. As the distribution was not balanced neither in gender nor in age (at competitive and hobby players the majority were men), the effects of those were taken into account as well.

Statistical analysis was carried out with logistic regression, comparing probabilities of enrolling into individual groups. We applied cumulative logit model (Agresti, Kateri, 2011; Brant, 1990). Using this technique, the rate of appearance of the individuals (characterized by chess knowledge, age and gender) at the levels of the dependent variables can be obtained by the fitted regression model. If the factor of the chess knowledge is found to be significant for a given question, it means that the distribution of the responses changes with the level of the chess knowledge. For example, the factor of the chess knowledge was found to be significant in the question connected to “foresight”: The responses of the competitive chess players tend to be higher than those from the other two groups (Figure 5). This result in the responses of the competitive chess players having larger relative frequencies at higher ratings and smaller relative frequency at smaller ratings. The fitted models also take into account the potential effect of age and gender.

Figures show the connection of values of investigated features (e.g., accepting failure, seeking its cause) relating to the factor of chess knowledge (competitive chess players/hobby-players/non-players) and their distribution. When there was a difference between the two genders we depicted them distinctly.

Results

We accepted the correlation between the listed ten APA recommendations and investigated behavior patterns at $p < .05$ significance.

1. Making connections. No correlations were found.
2. Considering crises as solvable problems and...
3. ...accepting unchangeable situations. The results suggest that competitive chess players are better in tolerating failure ($p < .005$). Figure 1 displays distribution of answers from 1 to 5 referring to acceptance of failure in individuals of each group. It shows that the distribution of non-players is shifted towards to lower numbers (i.e. lower failure tolerance) compared to that of chess-players. Competitive chess players are in greater proportion at higher rates of acceptance of failure (3-4 columns) compared to the non-players.
4. Move toward your goals. We confirmed that chess players rated themselves more purposeful. This is demonstrated on Figure 2/a (men) and figure 2/b (women). It is apparent that both men and women chess players have chosen the better purposefulness categories than the non-players ($p < .001$). Chess players (men) are in greater proportion at

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higher rates of the better performing (3-4 columns) compared to the non-players. Women chess players (Figure 3/b) had statistically even better results than men (Figure 3/a). To avoid bias originating from men-women difference we have made separate figures for both genders.

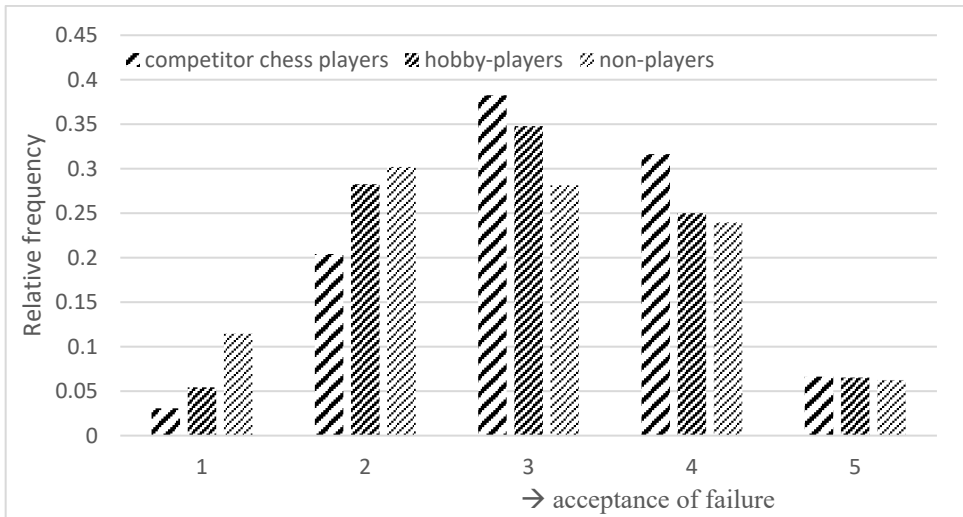


Figure 1. Acceptance of failure

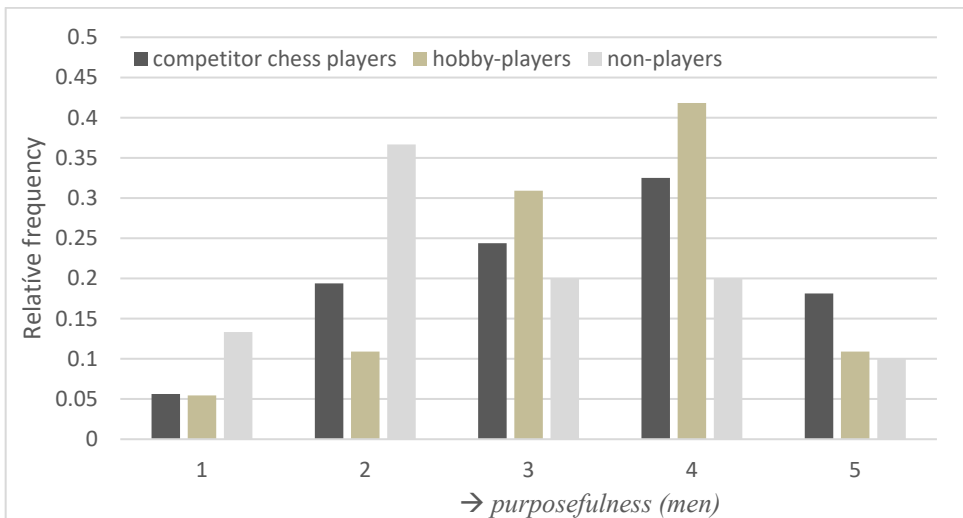


Figure 2/a. Purposefulness (men)

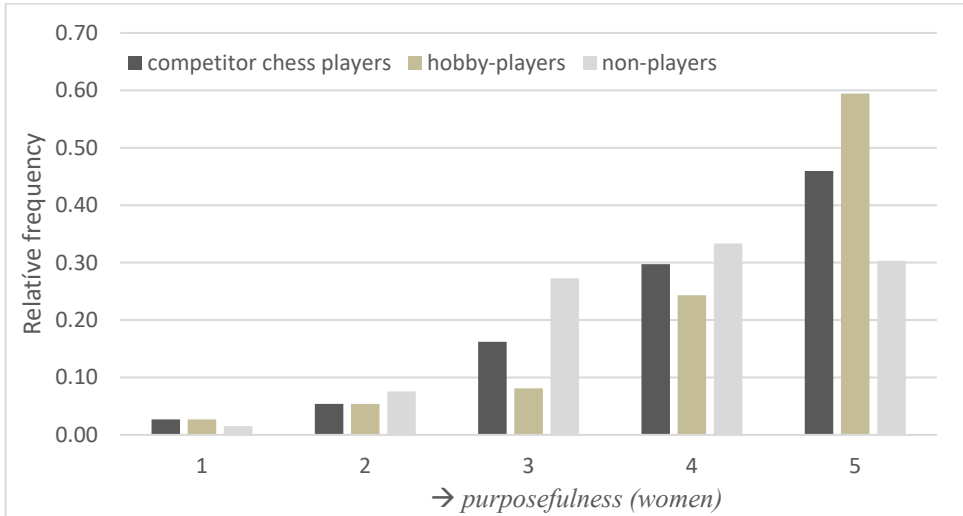


Figure 2/b. Purposefulness (women)

5. Make decisions in difficult situations as well. Chess players were more focused even in disturbing situations. We demonstrated it on figure 3/a (men) and figure 3/b (women).

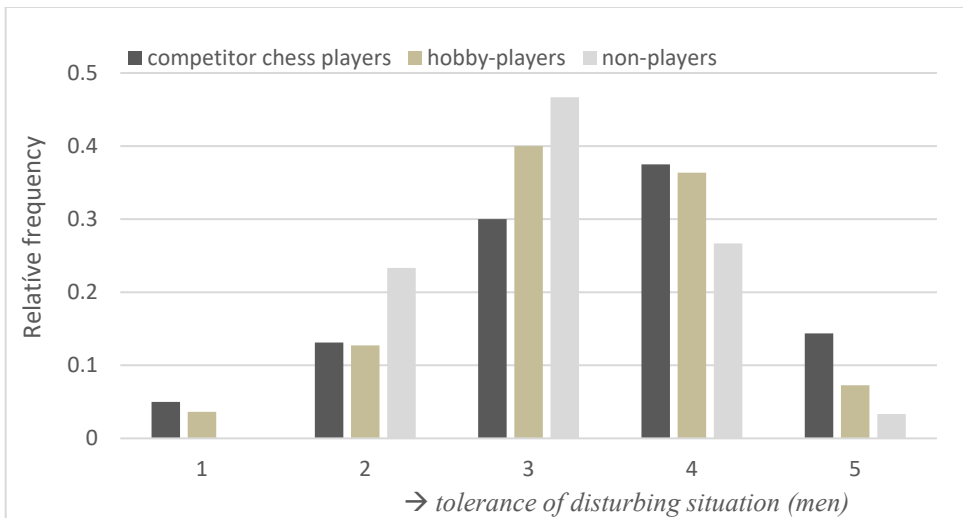


Figure 3/a. Tolerance of disturbing situation (men)

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Figure 3/b. Tolerance of disturbing situation (women)

Competitors and hobby chess players were enrolled into more focused groups (4 and 5) in greater proportion than non-players. Women particularly had better results (shifted to higher values compared to men). We did not find statistical difference between competitive players and hobby-players.

6. Looking for solution even in difficult or losing situations. In order to avoid effects of age on the figure we used data of 29-36 years old age group, as shown in Figure 4. Competitive chess players were seeking reasons of failure more intensively and gave higher values than members of the two other groups ($p < .02$) (Figure 4). Young people are seeking reasons of failure more intensively.
7. Maintain a positive attitude against problems. We did not find any differences regarding chess but older people have shown more confidence.
8. Keep things in perspective. According to the results, chess players have better foresight than others, but this difference decreases with age. It is remarkable as Figure 5 shows that competitive chess players are enrolled in greatest proportion into group 5. Figure 5 shows 29-36 age group again to avoid age-related distortion. This age group is balanced within groups so effects of playing chess are apparent.

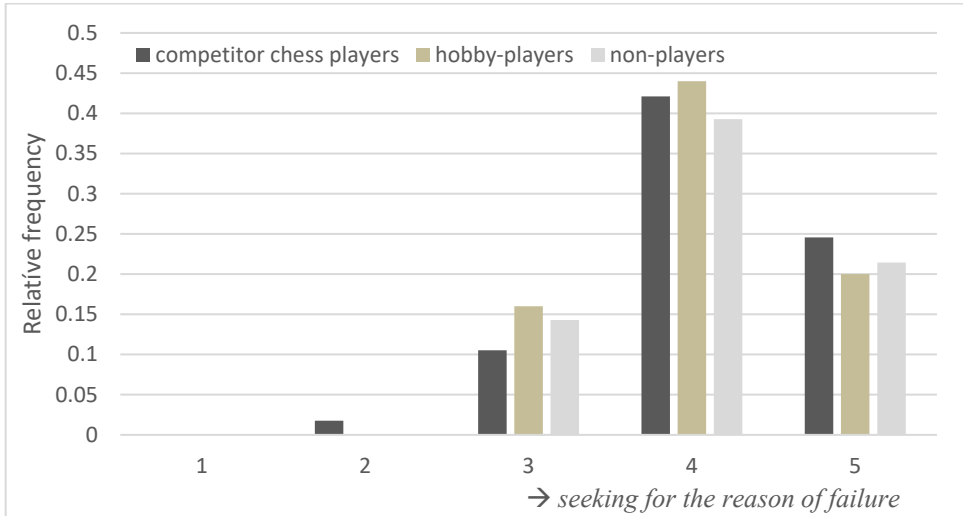


Figure 4. Seeking for the reason of failure

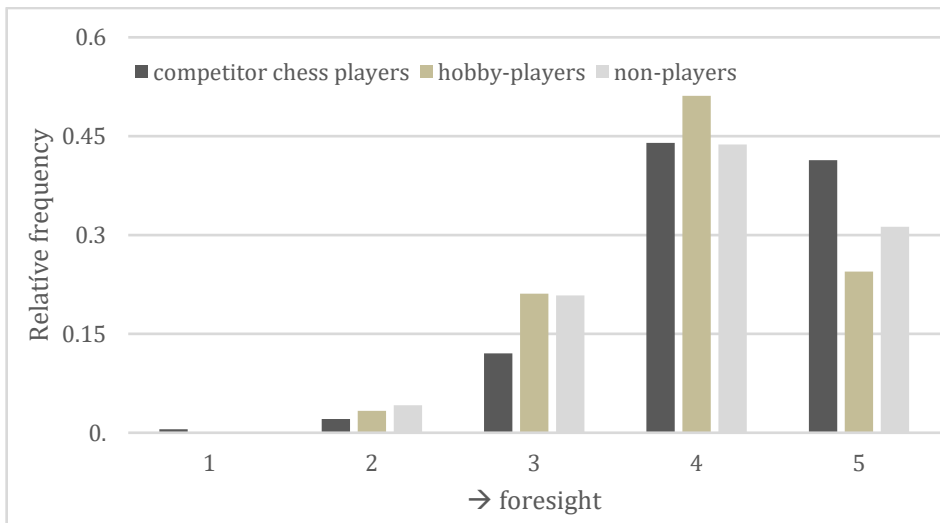


Figure 5. Foresight

9. Keep an optimistic outlook. We did not find any differences between the groups which means that chess players did not consider themselves more optimistic. They have mainly chosen the 'realistic' answer.

10. Take care of your health. Earlier we have evaluated the same questionnaire to assess healthy lifestyle with one-way variance analysis and post hoc (Tukey-style, with different elements) test. We found that chess players smoke less and eat healthier than others and there was a difference in the weekly amount of physical workout of competitive chess players and hobby-players ($p < .01$) and non-players ($p < .005$) (Medvegy et al., 2016).

Discussion

The goal of the current study was to examine whether there is a correlation between chess and resilience. We asked competitive chess players, hobby players and non-players to fill out a survey and then evaluated the responses of the groups regarding the ten points of recommendations to improve resilience (APA, 2016).

A chess player is necessarily in relation with his/her trainer, teammates and opponents, therefore chess helps to create social connections. We predicted that chess players would make better connections. However, the results did not support this hypothesis, we did not find a significant difference between the groups. It turned out that women and elderly hobby-players make relations easier. The results support the hypothesis that chess players tolerate failures more easily than non-players (see Figure 1). It is very important for a chess player because if a competitor became frustrated during a chess game after an unexpected turn or defeat, it would negatively affect his subsequent decisions. Successful chess players need to be able to adapt to new situations quickly.

In line with our hypotheses, the results showed that chess players are more purposeful (Figure 2/a, 2/b) and better able to focus even in disturbing conditions (Figure 3/a, 3/b) than non-chess players.

Our survey found that chess players analyze the reasons of their failures more thoroughly than non-chess players (Figure 4). Successful chess players always analyze their games to learn from them.

Only those become good players who approach their chances positively and consider problems as mere difficulties to cope with. Regarding self-image, we did not find any differences between the groups, so the result did not support the hypothesis in this question.

Successful chess players think in perspective and anticipate the consequences of their decisions on the board. The hypothesis was confirmed, as chess players were found to think more in perspective than non-chess players (Figure 5).

The results did not support the hypothesis that chess players are more optimistic than non-chess players, and we found no significant difference between groups. Chess players consider themselves mostly realistic.

Earlier we have evaluated the same questionnaire to assess healthy lifestyle. We concluded that chess players smoke less, eat healthier and make more activities than others (Medvegy et al., 2016). In three of the ten recommendations (APA, 2016), we found no significant difference between groups, while the answers to the other questions suggest that chess players (especially competitors) are more resilient than non-chess players. This result supports our main hypothesis that chess players have a higher level of resilience than of those who do not play chess. Based on our study, we can state that not only physical sports, but also chess, which is one of the most popular mental sports, has a positive effect on resilience.

Limits of the Study and Recommendations for Further Investigation

Although we reached decent results, our study has a few limitations. The participants in the study evaluated themselves, so the results were subjective. However, the above distortion affected all examined groups equally, so the groups with a large number of participants became comparable. We did not examine what other hobbies non-chess players have that could improve their resilience.

We did not examine a separate group of top chess players (e.g., grandmasters), our strongest group consisted of average tournament players. In future studies it would be worthwhile to compare the level of resilience of top players and tournament players.

Conclusions

Several studies have found that physical sports strengthen psychological immunity or resilience (e.g., Chacón-Cuberos et al., 2019). With our research, we tried to support the hypothesis that chess also strengthens resilience.

The results support the hypothesis since competitive chess players who participated in our study were on a higher level of resilience than the control group. They accept failures and unchangeable situations more easily, they are more purposeful and forward-thinking, they make better decisions even in disturbing situations, and live healthier life than non-chess players.

These results also indicate that in physical sports not only the physical activity but also the psychological factors play an important role in strengthening resilience.

Hence it is worth learning playing chess – preferably from childhood – because it improves resilience and adaptability.

Author statement

We confirm that the manuscript has been read and approved for submission by all the named authors.

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