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# Examination Of The Nutritional Habits And Attention Levels Of Secondary School Students Who Do And Do Not Do Sport

Ayşegül ÇELİK[1A], İbrahim BOZKURT[2B]

[1] *Ministry of National Education Adil Karaağaç Vocational and Technical Anatolian High School Selçuklu Konya/TURKEY*
[2] *Selcuk University Faculty of Sports Science, Konya/TURKEY*

*Address Correspondence to Ayşegül ÇELİK: e-mail: ayseince4242@hotmail.com*

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A: Orcid ID: 0000-0002-2448-0382B: Orcid ID: 0000-0003-1413-853X

**Abstract**

The aim of this study was to examine the nutritional habits and attention levels of 250 secondary school students in Konya, divided into groups of those who participate in sports and those who do not. A personal information form created by the researcher was used to gather socio-demographic data. To assess the participants' healthy eating attitudes, the Attitude Scale Towards Healthy Eating (ASHE), whose validity and reliability study was conducted by Tekkurşun Demir and Cicioğlu (2019), was employed. Participants' attention levels were determined using the letter form of the Bourdon Attention Test, developed by Benjamin Bourdan in 1955. Before analysis, the variance and homogeneity of the data were tested. Appropriate statistical techniques were then applied based on the nature and distribution of the data. By determining that the data were normally distributed, Independent Samples t-test was used in paired comparisons, One-WayAnova test was used in multiple comparisons, and Tukey HSD test was used to determine the source of difference. In addition, the Paired-Samples t test was used to compare the attention test scores at the beginning and end of the study. The results showed a significant positive difference in attention levels for students who engaged in sports across all branches compared to those who did not. Furthermore, regarding attitudes towards healthy eating and its subdimensions (excluding the "unhealthy nutrition" sub-dimension), a significant positive difference was found in the sports groups compared to the non-sports groups. The scores for the unhealthy nutrition dimension were lower in the sports groups than in the non-sports groups, and these results were statistically significant. Based on these findings, it can be concluded that secondary school students who participate in sports exhibit more positive nutritional habits and higher attention levels than their non-sporting peers.

**Keywords:** Attention; Education; Habit; Nutrition; Sports.

**Spor Yapan ve Yapmayan Ortaöğretim Öğrencilerinin Beslenme Alışkanlıkları ve Dikkat Düzeylerinin İncelenmesi**

**Özet**

Bu çalışmamızda; Konya'da öğrenim gören spor yapan ve yapmayan 250 ortaöğretim öğrencisinin beslenme alışkanlıkları ve dikkat düzeylerinin incelenmesi amaçlanmıştır. Araştırmacının oluşturduğu kişisel bilgi formu,

sosyo-demografik verilerin elde edilmesi için kullanılmıştır. Tekkurşun Demir ve Cicioğlu (2019)'nun geçerlilik ve güvenirlilik çalışmasını yaptığı Sağlıklı Beslenmeye İlişkin Tutum Ölçeği (SBİTÖ) katılımcıların sağlıklı beslenme tutumlarını belirlemek için kullanılmıştır. Katılımcıların dikkat seviyelerini belirlemek için 1955'de Benjamin Bourdan'nın geliştirdiği dikkat testi harf formu kullanılmıştır. Verilerin, varyans ve homojenlikleri test edilmiş, uygun test teknikleri verilerin özellik ve dağılımları göz önünde bulundurularak uygulanmıştır. Normal dağılım gösterdiği belirlenen verilerin çoklu karşılaştırmalarda One-WayAnova, farklılık kaynağının belirlenmesinde Tukey HSD testi ikili karşılaştırmalarında ise Independent Samples t test kullanılmıştır. Çalışmamızın ilk ve son test olarak uygulanan dikkat test puanlarının karşılaştırmasında Paired-Samples t test kullanılmıştır. Elde ettiğimiz verilerin sonucunda tüm branşlarda spor yapanların yapmayanlara oranla dikkat düzeylerinde olumlu yönde anlamlı farklılık belirlenmiştir. Çalışma gruplarında kötü beslenme alt boyutu hariç sağlıklı beslenmeye ilişkin tutumlar ve alt boyutlarında spor yapanlarda spor yapmayanlara oranla olumlu yönde anlamlı farklılık belirlenmiştir. Spor yapanlarda yapmayanlara oranla kötü beslenme boyutu değerleri düşük çıkmış ve elde edilen sonuçların istatistiksel olarak anlamlı olduğu belirlenmiştir. Bu çalışma bulgularına bağlı olarak spor yapan ortaöğretim öğrencilerinin spor yapmayan öğrencilere oranla beslenme alışkanlıklarının daha pozitif ve dikkat düzeylerinin daha yüksek olduğu söylenilebilir.

**Anahtar Kelimeler:** Spor, Dikkat, Beslenme, Alışkanlık, Eğitim.

## INTRODUCTION

Staying at home for a long time during the pandemic has caused a decrease in physical activities, restriction of social life, deterioration of eating habits, psychological factors and stress-related behavioral disorders. Nutrition, growth and development in adolescents are very important for the normal course of growth, cognitive success, physical success, school and sports success of the individual (5). One of the factors that negatively affects students' success today is distraction. Rapid developments in technology such as computer games and visual media have attracted students' attention, and thus sports, painting, music and academic careers, which students should actually do, have been pushed to the background. Having a healthy society in a country affects the welfare level of the country, as well as reducing health expenses and crime rates in the country. In this context, the effect of healthy nutrition and sports is important for the country's economy and welfare. Our study is valuable in terms of creating a different perspective and awareness on these facts. Therefore, this study is important in determining the cause of learning difficulties and widespread behavioral problems in education and in offering suggestions for the solution of these problems. Sports are defined as activities that are done consciously in accordance with certain rules for the purposes of having fun, competing, struggling and having a healthy life (16). Sports activities enable individuals to have a more balanced and sound lifestyle physically, mentally and spiritually (8). Considering the positive effects of sports activities on an individual's psychology, it is stated that sports activities will be used in the treatment of psychological disorders (44). Sports are instrumental in achieving a fit and cheerful body structure, protecting against diseases, and slowing down age-related organic decline. Thanks to these features, it can be said that sports have a supporting role in medicine (5, 8). In a study conducted on cancer, which is the most important health problem of our age, it has been emphasized that participation in sports is beneficial in the fight against cancer. It has been determined that it increases the quality of life in the treatment and rehabilitation processes of cancer cases encountered especially in childhood (23). Directing cognitive receptors to extraordinary stimuli that people can reach through their senses and that occur in their environment is defined as attention (17). When a person turns their attention from one stimulus to another, it is called distraction. It is inevitable for attention to shift and shift to other things, the main reason for this is mental and physical fatigue (4). Short attention span, characterized by hyperactivity, verbal and behavioral impulsivity are developmental disorders occurring in childhood. During childhood; children have difficulty directing their attention and movements to the goal, and it is known that they often cannot engage in social interaction within the framework of expected behaviors. This situation negatively affects children's relationships with both their peers and adults. The most important problem for these children is their success disproportionate to their intelligence (20). Concentration is one of the most critical elements for success in sports. The failure of athletes who cannot concentrate highlights the importance of attention in sports (14). Nutrition is an important factor for the continuation of daily life and growth and development. People, like all living things, must be fed throughout their lives (9, 35). Nutrition is not a matter of filling the stomach or getting what one wants. In other words, nutrition reaches its goal when it is done in a balanced and sufficient

way (25). People need to have a balanced diet in order to have a healthy body and to protect their health. Balanced nutrition is important for people to be able to fulfill their daily necessary nutrients; growth, development, and physical activities. It is important in nutrition to take the necessary energy into the body in an economical way and in a balanced way without losing its nutritional value (25, 6). It is thought that the research on the nutritional habits and attention levels of secondary school students who do and do not do sports will shed light on the studies that can be conducted in different scopes and dimensions.

## METHOD

The universe of the study consisted of secondary school students in Selçuklu district of Konya province, while the sample group consisted of 250 volunteer secondary school students, 125 of whom were involved in sports and 125 of whom were not involved in sports, in schools operating in Selçuklu, Konya. Ethics committee approval was obtained for the study from the relevant unit of Selçuk University with the number E-40990478-050.99-51590. In order to determine the attention levels of the eating habits of secondary school students who were involved in sports and those who were not, an attention test and an attitude scale towards healthy nutrition were applied. After the pre-tests were applied, 125 students were given sports activities for 1 hour three days a week for 12 weeks and then a post-test was applied. In addition, a post-test was applied to 125 other students who did not participate in sports.

Data Analysis: The data obtained as a result of the research were classified and made ready for statistical analysis. The homogeneity and variances of the obtained data were tested and test techniques appropriate to the characteristics and distributions of the data were used.

Independent Samples t test was used in pairwise comparisons and One-Way Anova was used in multiple comparisons, while Tukey HSD test was used to determine the source of difference. In addition, Paired-Samples t test was used to compare the attention test scores at the beginning and end of the study. For this study; Cronbach's Alpha value was determined as 0.84 in the Knowledge dimension, 0.70 in the

Emotion Towards Nutrition dimension, 0.77 in Positive nutrition, 0.79 in Malnutrition, and 0.77 in General Nutrition. In the statistics of the groups, $p<0.05$ indicates that there is a significant difference between the groups and $p>0.05$ indicates that there is no significant difference between the groups.

### Ethical approval and institutional permission

Ethics committee approval was obtained for the study from the relevant unit of Selçuk University with the number E-40990478-050.99-51590.

Conflicts of Interest The authors declare no conflict of interest.

Note: This study was produced from the doctoral thesis titled “Examination Of The Nutritional Habits And Attention Levels Of Secodary schol Students Who Do End Do Not Do Sport” published in 2023.

## FINDINGS

**Table 1.** Socio-demographic data of the research group

| **Gender** | **f** | **%** | **Age** | **f** | **%** |
|---|---|---|---|---|---|
| Female | 68 | 27,2 | 13-15 | 159 | 63,6 |
| Male | 182 | 72,8 | 16 and over | 91 | 36,4 |
| **Siblings** | **f** | **%** | **Education Level of Mother** | **f** | **%** |
| 1-2 siblings | 94 | 37,6 | Elementary | 120 | 48 |
| 3-4 siblings | 139 | 55,6 | Secondary | 47 | 18,8 |
| 5 and more siblings | 17 | 6,8 | High School | 50 | 20 |
| | | | University | 33 | 13,2 |
| **Education Level of Mother** | **f** | **%** | **Education Level of Father** | **f** | **%** |
| Elementary | 120 | 48 | Elementary | 59 | 23,6 |
| Secondary | 47 | 18,8 | Secondary | 48 | 19,2 |
| High School | 50 | 20 | High School | 83 | 33,2 |
| University | 33 | 13,2 | University | 60 | 24 |

Table 1 includes the frequency and percentage values of the gender, age, number of siblings, grade, and mother and father's education levels of the students participating in the study.

**Table 2.** Changes in Nutritional Dimensions Depending on the Branch Factor

| **Information about nutrition** | **n** | **x** | **Ss** | **F** | **p** |
|---|---|---|---|---|---|
| Dart | 25 | 4,12 | ,59 | ,244 | ,913 |
| Wrestling | 25 | 4,05 | ,87 | | |
| Table Tennis | 25 | 4,01 | ,72 | | |
| Chess | 25 | 4,18 | ,84 | | |
| Taekwondo | 25 | 4,02 | ,58 | | |
| Total | 125 | 4,07 | ,72 | | |
| **Emotion Towards Nutrition** | **n** | **x** | **Ss** | **F** | **p** |
| Dart | 25 | 2,79 | ,64 | 2,462 | ,49 |
| Wrestling | 25 | 2,95 | ,94 | | |
| Table Tennis | 25 | 2,88 | ,64 | | |
| Chesss | 25 | 2,63 | ,69 | | |
| Taekwondo | 25 | 3,25 | ,74 | | |
| Total | 125 | 2,90 | ,76 | | |
| **Positive Nutrition** | **n** | **x** | **Ss** | **F** | **p** |
| Dart | 25 | 3,95 | ,80 | 1,068 | ,375 |
| Wrestling | 25 | 4,02 | ,78 | | |
| Table Tennis | 25 | 3,72 | ,75 | | |
| Chess | 25 | 4,02 | ,84 | | |
| Taekwondo | 25 | 3,71 | ,66 | | |
| Total | 125 | 3,89 | ,77 | | |
| **Malnutrition** | **n** | **x** | **Ss** | **F** | **p** |
| Dart | 25 | 3,87 | ,58 | ,701 | ,593 |
| Wrestling | 25 | 3,46 | 1,33 | | |
| Table Tennis | 25 | 3,57 | ,99 | | |
| Chess | 25 | 3,74 | ,98 | | |
| Taekwondo | 25 | 3,58 | ,77 | | |
| Total | 125 | 3,65 | ,96 | | |
| **Nutrition General** | **n** | **x** | **Ss** | **F** | **p** |
| Dart | 25 | 3,69 | ,42 | ,256 | ,906 |
| Wrestling | 25 | 3,62 | ,64 | | |
| Table Tennis | 25 | 3,54 | ,50 | | |
| Chess | 25 | 3,64 | ,55 | | |
| Taekwondo | 25 | 3,64 | ,41 | | |
| Total | 125 | 3,63 | ,50 | | |

When the changes in the nutrition dimension were examined according to the nutrition survey measurements depending on the branch factor in Table 2, it was determined that there was no statistically significant difference between the branches as a result of the measurements made in the nutrition subdimensions (P>0.05).

**Table 3.** Changes in nutritional habit dimensions depending on sports activity

| Dimensions | | n | x | Ss | t | p |
|---|---|---|---|---|---|---|
| **Nutrition Information** | Athlete | 125 | 4,07 | ,72 | 4,114 | **,000** * |
| | Non-athlete | 125 | 3,65 | ,90 | | |
| **Emotion Towards Nutrition** | Athlete | 125 | 2,90 | ,76 | 2,055 | **,041** * |
| | Non-athlete | 125 | 2,69 | ,87 | | |
| **Positive Nutrition** | Athlete | 125 | 3,89 | ,77 | 4,579 | **,000** * |
| | Non-athlete | 125 | 3,40 | ,89 | | |
| **Malnutrition** | Athlete | 125 | 3,39 | ,97 | 2,143 | **,033** * |
| | Non-athlete | 125 | 3,65 | ,96 | | |
| **Nutrition General** | Athlete | 125 | 3,63 | ,50 | 5,421 | **,000** * |
| | Non-athlete | 125 | 3,28 | ,50 | | |

* p<0.05 significant difference between groups

Table 3 shows the changes in the nutrition sub-dimensions of students who do and do not do sports. It was observed that the measurement results of students who do sports in the nutrition sub-dimensions were higher than those who did not do sports and the difference between the groups was significant (P<0.05).

**Table 4.** First and last measurement changes of branches

| Branch | Measurements | n | x | Ss | t | p |
|---|---|---|---|---|---|---|
| **Dart** | First Measurement | 25 | 93,00 | 13,11 | -4,294 | **,000*** |
| | Last Measurement | 25 | 105,12 | 3,38 | | |
| **Wrestling** | First Measurement | 25 | 84,32 | 11,58 | 9,002 | **,000*** |
| | Last Measurement | 25 | 104,00 | 4,56 | | |
| **Table Tennis** | First Measurement | 25 | 89,20 | 13,58 | 5,909 | **,000*** |
| | Last Measurement | 25 | 104,92 | 4,65 | | |
| **Chess** | First Measurement | 25 | 87,40 | 9,58 | 8,696 | **,000*** |
| | Last Measurement | 25 | 105,20 | 4,63 | | |
| **Taekwondo** | First Measurement | 25 | 86,72 | 12,22 | 7,396 | **,000*** |
| | Last Measurement | 25 | 106,00 | 2,65 | | |

* **p**<0.05 significant difference between groups

When the attention values of the branches are examined in Table 4, it is determined that the post-test measurement values in all branches are higher than the first test measurement values and the difference is statistically significant (P<0.05).

**Table 5.** Total attention changes of students who do and do not do sports

| Measurements | n | x | Ss | t | p |
|---|---|---|---|---|---|
| **First Measurement of Sports** | 125 | 88,13 | 12,25 | 15,106 | **,000*** |
| **Last Measurement of Sports** | 125 | 105,05 | 04,04 | | |
| **First Measurement Without Exercise** | 125 | 93,41 | 14,06 | 1,440 | ,152 |
| **Last Measurement Without Exercise** | 125 | 90,78 | 16,54 | | |

* **p**<0.05 significant difference between groups

When Table 5 is examined, it was determined that the post-test measurements of the students who do sports were higher than the post-test measurements of the students who do not do sports and the difference was statistically significant (P>0.05).

**Table 6.** Relationship between attention and nutrition in those who do and do not do

| | Measurements | n | x | Ss | t | p |
|---|---|---|---|---|---|---|
| ATTENTION | First Measurement of Sports | 125 | 88,13 | 12,25 | 15,106 | **,000*** |
| | Last Measurement of Sports | 125 | 105,05 | 04,04 | | |
| | First Measurement Without Exercise | 125 | 93,41 | 14,06 | 1,440 | ,152 |
| | Last Measurement Without Exercise | 125 | 90,78 | 16,54 | | |
| | **Dimensions** | **n** | **x** | **Ss** | **t** | **p** |
| NUTRITION SUB-DIMENSIONS | Sports Nutrition Information | 125 | 4,07 | ,72 | 4,114 | **,000** * |
| | Non-exercising nutrition information | 125 | 3,65 | ,90 | | |
| | Emotion towards sports nutrition | 125 | 2,90 | ,76 | 2,055 | **,041** * |
| | Emotion towards nutrition without exercising | 125 | 2,69 | ,87 | | |
| | Positive Nutrition while doing sports | 125 | 3,89 | ,77 | 4,579 | **,000** * |
| | Positive Nutrition without exercising | 125 | 3,40 | ,89 | | |
| | Malnutrition with exercising | 125 | 3,39 | ,97 | 2,143 | **,033** * |
| | Malnutrition without exercising | 125 | 3,65 | ,96 | | |
| | Nutrition general with exercising | 125 | 3,63 | ,50 | 5,421 | **,000** * |
| | Nutrition generel without exercising | 125 | 3,28 | ,50 | | |

* **p**<0.05 significant difference between groups

When Table 6 is examined, it was determined that in the healthy nutrition attitude dimensions; the values of the students who do sports are more positive than the students who do not do sports in all subdimensions except the poor nutrition sub-dimension and this change is statistically significant (p<0.05). In the poor nutrition sub-dimension, it was determined that the statistical values of those who do not do sports are higher than those who do sports and the difference is significant (p<0.05). While no statistical change was observed between the first and last measurement values of attention of the students who did not do sports, it was determined that the change between the first and last measurement values of the group who did sports was statistically significant. (p<0.05).

## DISCUSSION AND CONCLUSION

In this study, which aims to examine the nutritional habits and attention levels of secondary school students who do and do not do sports; no statistical change was observed in the nutritional dimensions depending on the branches of the students (Table 2). In our study, it was determined that students who do sports have statistically more positive values in all nutritional dimensions compared to students who do not do sports (Table 3; p<0.05).

Alamehmet (3) determined that there was a significant difference between the nutritional subdimensions in his study where he examined the correlation values between the attitude scale and its subdimensions regarding healthy nutrition. Göral and Yıldırım (19) determined that there were significant differences in all sub-dimensions of attitudes towards healthy nutrition. Bıdıl and Kaya (10) found a positive low-level significant relationship between the knowledge about nutrition (BHB) factor and a negative lowlevel significant relationship between the malnutrition (KB) factor in their study. Akpolat (2) stated that the nutritional sub-dimensions were high when he evaluated the level of the attitude scale related to healthy nutrition in his study. Taşdelen (39) found positive and significant differences in nutritional attitudes and sub-dimensions in his study.

Furthermore, our study demonstrated that students who participate in sports showed statistically more positive values in all attention-related dimensions compared to those who do not (Table 4; p<0.05). As a result of their study, Civan and his colleagues reported that the attention levels of students who do table tennis are higher than those of students who do not do table tennis (13). In another study conducted by Asan, the attention levels of children who do table tennis were higher than those who did not (7). In another study,

the attention levels of students who do darts were higher than those who did not do this sport (45). In another study, the attention levels of people who do table tennis were higher than those who did not (37).

In our study, it was determined that students who do sports have a statistically more positive value in total attention changes compared to students who do not do sports (table 5; $p<0.05$). Koçak (26) reported in his study that the attention levels of students who do shooting sports are higher than those who do not do this sport. Kiremitçi (24) stated that the attention levels of individuals who do educational game sports are higher than those who do not do this sport. Kurtçephe reported in his study that there is a positive and significant difference in the increase in attention levels of sports (28). In another study, the researcher reported that there was a positive and significant difference between the attention levels and performance levels of archers (42). In our study, it was determined that students who do sports have a statistically more positive value in general compared to students who have high nutritional attitude sub-dimensions and attention levels who do not do sports (table 6; $p<0.05$).

It has been determined in studies that impulsivity can be seen in individuals who exhibit emotional eating attitudes and food addiction, and since impulsivity is at the forefront in hyperactivity disorder and attention deficit behaviors, these two issues may be related to each other (15). It is reported that inadequate and unbalanced nutrition shortens attention spans in students, leading to decreased perceptions and difficulty in understanding (34). Tayşi (40) stated in his study that many children who skip meals have attention deficit and hyperactivity disorder. Another study stated that children's exposure to lead causes their intelligence levels to be lower than normal and the risk of attention deficit and hyperactivity to be higher (31). In a study conducted on children in China, it was concluded that high blood mercury levels increase the risk of ADHD (12). Another study concluded that drinking water with high manganese levels causes high hyperactive behaviors in children (11). They stated that the mother's alcohol and smoking habits during pregnancy are dangerous for ADHD (33). As a result of a study conducted in Poland, it was stated that ADHD disorder was less common in children who were breastfed for more than three months and that breast milk was beneficial for intelligence development (21). A negative relationship was observed between fast food consumption and attention span (22). Nutrients and eating habits play an important role in many cognitive functions as well as learning and memory (32). In a research group with ADHD, it was observed that a diet in which additives were removed had a positive effect on children with ADHD (43). As a result of inadequate nutrition and malnutrition, the inability to create the components essential for brain health at cellular and tissue levels, lesions and toxic substances that occur in brain regions cause developmental delays (30). Iron supplements were given to children with ADHD who had iron deficiency disorder for one year and when their symptoms were examined, improvement was observed (27). In another study, the effect of zinc supplementation was investigated in children diagnosed with ADHD and a significant improvement was observed in ADHD scale scores in the experimental group that was given zinc food (38). In another study, omega fatty acid supplements improved spelling, reading, and decreased hyperactivity and restlessness symptoms in children with learning difficulties (29). In another study, it was stated that if a child with normal weight in the first years of birth remains in a protein energy deficiency state, even if the child achieves normal growth in the following processes, IQ, cognitive function, academic success and motor performance deficiencies are observed in the child. It was stated that these children had four times more attention deficits during health checks (18).

It is stated that not only hyperactive children but also healthy 3-year-old children may exhibit hyperactive behavior towards benzoate-containing preservatives and food dyes (36). In the study conducted by Schmidt and his colleagues, it was observed that oligoantigenic diet had a positive effect on children with DHEB (46). Akın (1) stated in his study that there was a significant relationship between ADHD diagnosis and symptoms and ready-made foods, artificial coloring and preservatives.

Demographic information regarding the frequency and percentage values of the students participating in the study, such as gender, age, number of siblings, class, and education levels of mothers and fathers, was determined. As a result of the measurements made in the nutrition sub-dimensions, it was observed that there was no statistically significant difference between the branches in those who did sports, but the measurement results of the students who did sports were higher than the students who did not do sports in the nutrition sub-dimensions and the difference between the groups was significant.

When examined in general, it was determined that the attention levels of the students who did sports were higher than the students who did not do sports and the difference was statistically significant. In the healthy nutrition attitude dimensions; it was determined that the values of the students who did sports were more positive in all sub-dimensions except the poor nutrition sub-dimension compared to the students who did not do sports and this change was statistically significant.

In light of these findings, it is evident that nutrition and sports positively influence attention. In the literature reviews, studies investigating the effects of nutrition and sports on attention levels are limited. More studies are needed with different measurement tools and different sample groups to obtain clearer data on this subject. The results obtained from studies conducted on attention deficit, hyperactivity disorder and nutrition overlap with our results. According to the results obtained from various studies conducted on this subject, the fact that the risk of ADHD increases in individuals exposed to harmful substances such as cigarettes, alcohol and mercury due to nutritional disorders shows that nutrition affects mental development and attention levels. Again, the results of the studies conducted on this subject support our results (that nutrition affects attention levels).

In light of these findings, it can be said that directing children with attention problems to various sports branches according to their interests and abilities can bring their attention levels to a positive level. As a result of our research, it was concluded that sports and healthy nutrition have a positive effect on attention levels. In addition, importance should be given to creating healthy nutrition awareness for the physical and mental health of individuals in the developmental age. In this context, balanced nutrition and regular sports will increase the attention level of individuals and therefore academic success will develop positively. It is hoped that the results of our study, which is limited to the characteristics of the sample group in the field of nutrition and sports, will contribute to the literature and offer a different perspective.

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