

The theses of the university dissertation (PhD)

Mens Sana in Corpore Sano?

**The Relationship between the Health-Behavioural and
Academic Achievement of Students of the Hungarian
Sports School System**

Karolina Eszter Kovács

Supervisor: Prof. Dr. Beáta Erika Nagy



UNIVERSITY OF DEBRECEN
Doctoral School of Human Sciences

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The aim of the dissertation and the determination of the topic

The role and relevance of the development of health awareness and health education is indisputable, which is also claimed by the results of Hungarian (HBSC, Hungarian Youth Research) and international (ESPAD, Eurobarometer) research, concerning the extremely high ratio of inactivity, the high prevalence of health-damaging behaviours and the lack of health-conscious lifestyle. Health education begins in childhood and lasts for a lifetime. It is no wonder that bad health indicators can be observed not only among children and youth but in the adult population as well. These health indicators are often worsening and the Hungarian population is in the top and the middle of the ranks regarding health-risk behaviours and illnesses related to that. Emphasizing the role of prevention and education, the National Curriculum puts emphasis on regular physical activity (everyday physical education) and health education. However, the increased presence of regular physical activity and health-conscious lifestyle can not only be detected in the field of everyday education but also in the educational sports schools of our country as a higher level. The sports school system has a dual system of goals: its primary aim is to train the young athletes of the different types of sports and to achieve sports success in the early life periods, thus it gives a priority to the domestic espoir player education in the different type of sports. However, this is done besides the other fundamental aim which is the fulfilment of the requirements of public education and the promotion and support of academic achievement. However, the issue of sports schools and their students is not clear and less investigated. Thus, we have only limited information on the operation and the actors of the system, both in terms of their academic and non-academic achievement characteristics.

Although the relevance of sports schools is indisputable, both regarding educational policy and sports policy, no investigation has put the emphasis on these aspects. The assessment of the various health-conscious and health-risk

behavioural characteristics of the school-age children is continuously done regardless of the stage of public education (e. g. Health Behavior in School-aged Children - HBSC, European School Survey Project on Alcohol and Other Drugs - ESPAD, or Hungarian Youth Research). In the sports school system, some example regarding the investigation of athletes pursuing sport in the associational sports schools could have already been seen (Rábai 2018a, 2018b, Pinczés & Pikó 2013), however, none of the previous research highlighted the group of students of educational sports schools thus no studies have been carried out regarding the composition of these schools or their academic and non-academic achievement. Moreover, the Hungarian sports school system is definitely unique: regular physical activity in the field of education is an important aspect everywhere in the world, which can be examined and experienced at different levels but also in each country, furthermore, European guidelines have been formulated to reduce inactivity and increase health awareness (e. g. Radtke & Coalter 2007, Stagiaire & Winther 2003). However, we cannot find another sports school system like the Hungarian sample, which makes a specific solution for the coordination of the espoir player education and the fulfilment of the academic requirements within the framework of public education.

In our dissertation, we undertake to visualize the structure of the Hungarian sports school system and to examine the characteristics of the students (as its actors), with particular regard to their academic achievement, their health awareness and health behaviour that are treated as non-academic, health-awareness achievement (Kovács 2015, Kovács et al. 2016). This is done from a national perspective through the comparative analysis of sports schools and non-sports schools (entitled traditional public educational institutions, Kovács 2018). Therefore, the problem of the dissertation was provided by the function of the sports school system, the exploration of the student characteristics and the study

of their academic and health-awareness achievement including health behaviour, and the comparison of sports school students with their peers (so with non-sports school students).

Applied methods

The target group of the research is the group of secondary school students, therefore the sample includes adolescents. To create the sample, three sports schools and three traditional secondary schools (secondary grammar or vocational school) were involved in the seven regions of Hungary and in Budapest. The sample was created by multi-stage stratified sampling method to achieve representativeness. The basis for selecting the institutions to be involved was tailored to educational sports schools. Sports schools and secondary schools having similar composition were selected in each region in order to control the social background variables adequately, based on the institutional and student composition analysed by the National Competency Measurement 2016 database. Educational sports schools were examined in the counties of the regions, and the proportion of students who attend sports schools was calculated. The group of traditional public educational institutions was provided by the data from the National Competence Measurement, which showed similar institutional characteristics to educational sports schools which meant the second step of the sampling. Finally, in the last step of sampling, random selection was made for the selection of institutions where students of the ninth, tenth, eleventh and twelfth grades were involved. Totally, 3015 people were involved, 1675 of them were students of 24 educational sports schools and 1340 non-sports school students from 24 traditional secondary schools.

In each school, students of each grade were involved. The institutes of the sample formed two main groups: one is the group of students learning in educational sports schools and the other is the group of traditional educational

institutions so the non-sports schools, which can be interpreted as the control group. This database entitled Health-Behaviour of Students of Sports Schools and Traditional Public Educational Institutions 2017 contains the data of 3015 students regarding their academic and non-academic achievement.

In the research, questionnaires were applied (as block of questions) that are validated or under validation. Accordingly, the survey consists of the following parts: a socio-demographic block, a general healthcare block, attitudes toward health-consciousness block (Health-conscious Behavioural questionnaire shortened version, Nagy & Kovács 2017), anxiety block (Child Anxiety Life Interference Scale, CALIS], Lyneham et al, 2013), coping block (Coping Flexibility Scale [CFS], Kato 2012), wellbeing block (WHO Wellbeing Questionnaire Shortened Hungarian Version, WBI-5, Susánszky et al, 2006), spiritual wellbeing block (Spiritual Well-Being Scale [SWBS], Cotton et al, 2005) and academic achievement block.

Results

Regarding sports schools, the training focus is primarily put on recruitment training, and athletes often come from families with lower social status. For this reason, **in our first hypothesis**, it was supposed that students of sports schools are more likely to have a family in a disadvantaged or multiply disadvantaged status having a worse financial background, based on a family background index of the National Competence Measurement Database 2016 (10th grade, students). Our hypothesis has been proven as the family background indexes were lower among sports school students regarding both the counties and the regions, reflecting our previous research results (Kovács, submitted) and general trends (e. g. Bourdieu 2000). Regarding sports school students, the lowest mean of the family background index could be experienced in the North Great Plain and Central-Hungary while it was the highest in Central-Transdanubia regarding the

regional level. In the case of non-sports schools, the lowest mean of the index could be detected in the North Great Plain while it was the highest in Budapest. Regarding the counties, the highest values could be seen in Heves, Komárom-Esztergom and Fejér counties, whereas the values of the indicator were the lowest in Szabolcs-Szatmár-Bereg county concerning sports schools. In the case of non-sports schools, the best values could be experienced in Budapest and the worst values in Jász-Nagykun-Szolnok county. In each case, a significant difference could be detected between sports schools and non-sports schools. The relationship between the territorial distributions and academic achievement was later examined in the second hypothesis, and the present results reflect and even confirm those results, as the relationship between the low family background index and poor academic achievement was demonstrated by other investigations, demonstrating the reliability of our research.

To discover the territorial differences is relevant not only because of the learning outcomes and the student background but also from the point of health-awareness. Thus, health-consciousness was measured firstly among sports school students at the level of the regions and the counties. As significant differences can be detected in academic achievement according to the settlement of the student (e. g. Garami, 2014, 2009; Polónyi, 2014; Hegedűs, 2016), it was assumed that this also could be experienced regarding health-awareness. All in all, this was proved as significant territorial differences could be detected concerning each measured variables (attitudes toward health-awareness, coping, anxiety, wellbeing and spiritual wellbeing). The subjective health status was the best among students learning in Budapest, while the lowest among those living in Central Hungary. The same could be measured regarding subjective fitness, however, but the ineffectiveness of the North-Hungarian region was also shown. The level of health awareness was the highest in the institutions of the South-Transdanubian region, while the lowest in those of the Central Hungarian,

strengthening the backwardness of the Central Hungarian region, i. e. Pest county, however, this perfectly illustrates the huge gap between the capital and the surrounding county. The level of coping flexibility was the worst among students learning in Central-Hungary and in the South Great Plain, while it was the highest in the North Great Plain, in North Hungary and in West Transdanubia. The level of anxiety was highest in Central Hungary, while the lowest in West Transdanubia. Finally, wellbeing was the highest in the Central Hungarian region and the lowest in the North Great Plain region, while the level of spiritual well-being was the highest in the South-Transdanubian region and the lowest in the Central Hungarian region.

Although the level of subjective wellbeing is outstandingly high in Pest County, this cannot compensate the values of other health-awareness factors that are far below the average, furthermore, this may be parallel to the low academic achievement and also conforms the results of Perény (2013) and The Hungarian Youth Survey as the level of health and physical activity is the lowest in this region. The other extreme is the South-Transdanubia region as most of the best values of the health-behavioural factors can be measured in this region and counties. It is interesting that West-Transdanubia is not the first place this region could be predestined in the first place concerning the economic indicators. The effectiveness of the Central-Transdanubian region and especially Veszprém County in it is not surprising given that this county owns a significant sports infrastructure (e. g. the external institutions of the National Handball Academy in Balatonfüred or the prominent role of handball in Veszprém). In addition, the results of the Hungarian Youth Survey also highlight the efficacy of this region as it is always in the forefront. At the same time, several well-known educational institutions having a great past and supporting both sport and learning can be found here such as László Lovassy Secondary Grammar School in Veszprém. The other stable point is the capital, which does not show an

outstandingly high performance but can be seen at the forefront of sport and health awareness. Several educational sports schools can be found in the capital, most of which are grammar schools which will be significant later. So the institutions of Budapest, in addition to their higher pursuit of academic achievement, e. g. Árpád Csanádi Primary School and Secondary Grammar School, they are in close cooperation with different associational sports schools or sports academies, ensuring the optimal conditions for building a sports career.

In our **second hypothesis**, it was assumed that students in sports schools are more effective regarding health-awareness as non-academic achievement compared to their peers learning in traditional high schools. The results of health-consciousness were ambivalent: the sports school students' significantly higher health-consciousness and more positive attitudes toward that are not unambiguous. Concerning the general health-awareness indicators, substance use, alcohol consumption, spirit, cocktail and beer consumption, water consumption, energy drink consumption and binge drinking are significantly higher among sports schools students besides higher amount of sleeping hours while the frequency of eating fast foods and the frequency of wine consumption are significantly higher among non-sports school students. This also shows the ambivalence, as some risk behaviours are not less but more frequent among sports school students, which can be attributed to several factors, such as the impact of the institution, peer influence, socioeconomic status or the athlete identity (Kovács & Nagy 2017; Veliz et al, 2015; Kwan et al, 2014, Lisha & Sussman, 2010, Faurie et al, 2004), but its exact exploration requires further research. In terms of psychological factors, significant differences could be experienced in health-awareness, coping flexibility, wellbeing and spiritual wellbeing, as well as in subjective fitness. In all cases, sports school students were more successful (Kovács & Nagy 2017, Kovács 2014, Kovács & Perényi, 2014, Pikó et al. 2012 Piko & Keresztes 2007, Pluhár et al. 2004).

Therefore, it can be seen that students learning in sports schools are mentally in aware of the dangers of risk behaviours and they deprecate them in most cases e. g. they know that smoking or illegal drug use is harmful to health, they know that the right amount of water consumption or sleep is indispensable for the proper mental and physical performance, or how they can reach emotional balance. However, it is clear that they cannot project this mental level into the practical level thus the prevalence of health-damaging behaviours may also be higher. A high level of substance use is also common among athletes, especially in terms of smoking and alcohol consumption, which can be determined as a social characteristic and a social and institutional effect, thus the social and institutional levels must also be taken into account besides the individual level. In higher education, we have already proved (Pusztai et al. 2018, Kovács et al. 2016) that based on intragenerational integration, the likelihood of health-awareness is higher among students who study in a faculty (and surrounded by peers) where health protection and the avoidance of harmful behaviours are the fundamental samples. Similarly, the chance to engage in health-conscious lifestyles is lower in campuses where the prevalence of health-damaging behaviours is high and these behaviours are accepted. This can also be attributed to the field of secondary education as the social and institutional effects work in a similar way in this level of education.

As part of this hypothesis, institutional added value was also measured in the different types of institutions, supposing that a significant institutional value added value can be detected regarding health-awareness as non-academic achievement in sports schools compared to the traditional institutions. As only less knowledge is provided regarding the sports school, the relevance of the hypothesis is indisputable. The effects of all of the health-consciousness components (health-related attitudes, anxiety, coping, wellbeing, spiritual wellbeing) were examined, although only spiritual wellbeing showed a

significant institutional impact which was negative. This is opposite to our assumption as religion and spirituality do not belong to the main institutional profile (except those sports schools which are denominational). However, according to previous research, it is clear that spirituality has a significant added value in sports successes (e. g. Mueller et al. 2001, Pikó 2005a, Kopp 2012) so it would be important to put more emphasis on this segment on sports schools as well. Furthermore, concerning health-awareness and coping flexibility, a significant increase could be detected in non-sports schools, which can also be detected as an institutional effect. On the contrary, we assumed that sports schools would be more effective in coping, wellbeing, and anxiety. However, this is true at the level of the individual, as the indicators of mental health and health-awareness of sports school students are better overall. Nevertheless, it seems that this comes from their athletic identity and not from the nature of the institution. Students learning in sports schools, as a significant part of them pursues sport as a leisure time activity, are able to illustrate the positive impact of sport on mental health, but this is limited to the individual level. However, it can be concluded that if sports school system could increase the effectiveness of such health indicators by professionals (e. g. psychologists), health days, prevention etc., not only mental health and health-consciousness (both mentally and physically) but also the sports achievement could be increased. In addition, thinking systematically, it becomes obvious that both the institution itself and the sports school system can benefit from this either at individual or at micro, mezo and macro level in a long term (Bronfenbrenner 1979).

In our **third hypothesis**, we supposed that the students of the sports schools are more effective in academic achievement in comparison with their peers learning in traditional high schools. To measure this, partly our own database and partly the database of the National Competence Measurement 2016 were applied. In this regard, it can be clearly stated that, unlike the assumption, the students of

traditional educational institutions have better academic achievement, either concerning the mean of their grades of the different subjects or the subjective academic achievement indicators or even concerning the objective index provided by data of the 2016 National Assessment of Measurements on the 10th grade. This is true not only for the institutions participating in the research, but also for measuring all of the sports schools and other secondary educational schools in the country. Although sports school students have academic achievement above the average at an international level (Australia, Canada, Netherlands, Sweden) based on the summary of Radtke and Coalter (2007), and the zero-sum equation (Coleman, 1986) seems to be proven in Hungary. Thus, our research results reinforce the previous research results of Kovács (2015) among tertiary students at secondary level, according to which regular sports do not contribute to academic achievement after achieving a certain level (national, international). As the primary goal of the athletes is to harvest the benefit from the high amount of invested time and energy at the field of sport, they are able to release factors that can hinder or interfere them in this (such as learning). Thus, a part of my hypothesis was proved as sports school students were more successful in some aspects of health awareness. At the same time, the control group proved to be significantly more successful regarding certain objective health indicators (such as alcohol consumption, substance use, energy drink consumption etc.) as well as the academic achievement of the non-sports school students was higher as well.

Finally, the aim of the research was to map out the relationship between the factors of academic and non-academic achievement so the strength and direction between health-behaviour (health-awareness, coping, anxiety) and academic performance (mean of the subjects). Thus, in our **fourth hypothesis**, we assumed a positive relationship between health-consciousness and academic achievement. This hypothesis is proved as health-consciousness showed a weak

but significant positive relationship with both objective and subjective academic achievement. Regarding coping flexibility, the same could be found, as it showed a weak but significant positive relationship with both kinds of academic achievement. Concerning anxiety, a weak but significant negative correlation could be experienced with both learning outcomes. Finally, wellbeing shows a weak negative relation with subjective academic achievement while spiritual wellbeing shows the same with both objective and subjective academic achievement. The assumptions based on previous research (e. g. Hartman 2008, Castelli et al. 2007, Kovács 2015) have been confirmed. The correlations can be well linked to our previous hypotheses, and can even function as a link between the hypotheses related to academic achievement and health-consciousness, as the similar territorial distributions can partly be explained by this, the previously stated facts can interweave and the reliability of the present research also grows.

In addition, as part of the hypothesis, we draw attention to the factors influencing the attitudes related to health-consciousness and academic performance. We first analysed the attitudes related to health-consciousness, and we assumed that women were more health-conscious (Nagy & Kovács, 2017, ESPAD 2015, Pop et al. 2013), furthermore, the higher educational level of the parents, the better objective and subjective financial status and the bigger type of settlement has a negative effect (Nagy & Kovács, 2017, Dékány et al. 2012, Pikó & Fitzpatrick 2007, Humensky 2010, Tuinstra et al 1998). Moreover, we assumed that sports school membership, regular physical activity (regardless to the type of the institution), better subjective health status and fitness, mental health above the average (higher level of subjective religiousness, coping flexibility, wellbeing and spiritual wellbeing as well as lower level of anxiety) have a positive impact (Nagy & Kovács 2017, Kovács & Nagy 2015, Pikó & Fitzpatrick 2007 etc.). However, this hypothesis was only partly proven as some factors showed the opposite impact compared to our original assumption. The

impact of the sports school membership is significant by itself, but unlike the expectations it is negative, and this is not changed by the socio-demographic or psychological factors. The impact of competitive sports is also significant but positive and reinforces the impact of sports school membership even with the involvement of social variables, although the psychological factors eliminate the significant impact. The tertiary educational level of the mother also has a significant positive impact (Dékány et al. 2012, Pikó & Fitzpatrick 2007). Subjective financial situation above the average is clearly and continuously negative, confirming the previous research results of Pikó. The effect of the larger settlement type was also positive and significant (Dékány et al. 2012, Keresztes et al. 2006). Psychological factors have also clearly shown a significant effect as subjective health status and fitness and mental health components (coping flexibility, including adaptive coping, wellbeing and spiritual wellbeing) above the average showed a positive while anxiety and assessing coping above the average showed a negative impact on health-consciousness (Nagy & Kovács 2017, Pikó & Fitzpatrick 2007, Humensky 2010, Tuinstra et al. 1998). At the same time, the effect of gender was not significant, either by itself or with the involvement of other variables, and the influence of the father's educational level and the subjective financial status of the student was not significant too.

In addition, factors affecting academic achievement were also investigated. We assumed that students' academic achievement is positively influenced by the sports school membership, the competitive sports identity, gender (being a woman), the high level of parental education, the objective and subjective financial status above the average, the larger type of settlement, moreover, by the health and fitness status, health-consciousness, coping, wellbeing and spiritual wellbeing above the average and anxiety below the average. This hypothesis is partially proven. The impact of sports school membership is

significant by itself but negative, and this effect is only eliminated by the involvement of gender, socio-demographic variables and psychological factors. The impact of the secondary vocational school classification is also significant, and this is not changed by the socio-demographic or psychological indicators either. Thus, the fulfilment of goal related to the academic achievement set up by SIOSZ (2012) is not visible yet. The impact of competitive sport identity is significant and negative, but similarly to the sports school membership, the additional individual variables overwhelm and neutralize it. The effect of the gender is also significant and the same can be noted regarding the mother's educational level (e. g. Chung 2015). In addition, the objective financial situation above the average is clearly and continuously negative, but its effect is neutralized by the psychological indicators. Concerning psychological factors, the effects of wellbeing, spiritual wellbeing and anxiety are also clearly significant, as wellbeing and spiritual wellbeing above the average has a positive while anxiety above the average has a negative impact on learning outcomes (Keyes et al. 2011, Fehérvári 2008, WestEd 2003, Roeser et al. 1998). This may be due to the individually higher level of anxiety related to the given area and the subject (Nótin 2015, Putnam 2010).

Since the distinctiveness and uniqueness of student groups are not negligible regarding academic and health-awareness achievement, we have already studied the different student groups based on the health and learning outcomes in a national study (HBSC 2014, Kovács et al. submitted). Based on this research, in the last section of our fourth hypothesis, we wanted to create student clusters based on the factors of subjective academic achievement and non-academic achievement (health-behaviour, coping, anxiety, wellbeing and spiritual wellbeing, subjective health and fitness status), assuming that the same clusters can be formed in this research. Furthermore, we wanted to measure their distribution regarding the socio-demographic variables such as the gender, the

educational level of the parents, the type of settlement and subjective religion, and our further aim was to detect the territorial differences in the distribution of student clusters at regional level. Overall, our hypothesis is proven as, based on the involved variables, we could create similar clusters as in our previous national research entitled deviant, phlegm, stressful and balanced clusters. The difference in the distribution regarding gender is significant: the ratio of balanced and stressful cluster membership is higher among girls while that of phlegm cluster membership is higher among boys. Sports school students are overrepresented in phlegm cluster while non-sports school students in the stressful cluster. The difference between grades is also significant, the proportion of balanced and stressful cluster membership is decreasing while the proportion of deviant cluster membership is increasing. Concerning the significant differences in the type of the settlement, the ratio of the phlegm students is the highest in the capital, the proportion of the balanced students in the county seats and farms, that of deviant students in the farms while that of the stressful students in the villages and small towns is the highest. Also significant differences could be experienced in the educational level of the parents: the proportion of balanced cluster membership was highest in the case of parents with higher educational level while the deviant, stressful and phlegm cluster membership was higher among the children of parents with primary educational level, concerning both mothers and fathers. There is also a difference in cluster membership regarding subjective religiousness: the proportion of balanced cluster membership is higher among religious students while the proportion of deviant, stressful and phlegm cluster memberships is higher among the non-religious ones. Finally, significant territorial differences could be detected in the distribution of cluster memberships, The proportion of deviant students was highest in the North-Hungarian region and the lowest in South-Transdanubia; the proportion of phlegm students was the highest in Budapest and the lowest in

South-Transdanubia and in North-Hungary; the proportion of the stressful students was outstandingly high in Central-Hungary and the lowest in the North Great Plain and the proportion of the balanced students was the highest in the South-Transdanubian region while in the lowest the Central-Hungarian region.

Though the hypotheses of the research and their results are interweaved and represent a unified picture, providing a clear picture of the sports school system, its actors and the academic and non-academic achievement of their students, the research obviously has some limitations. One of the major problems is the territorial distribution. Due to the small amount of sports schools and their unequal geographical location, it is difficult to meet the requirements of the multi-stratified sampling methods. Furthermore, the problem of the willingness of the institutional involvement can arise as another aspect. Sports schools do not have centralised control, they operate on a local pedagogical program and a local sports school curriculum for which no specific requirement or legal regulation obligatory (as it includes only the concept of sports school and the conditions for becoming a sports school). In this way, it is very difficult to create a sample that fully complies with the sampling requirements and it is even more difficult to create a control group. In more cases, we experienced rejection, which is problematic firstly in the case of the replacement of sports schools, as most of the counties have only one sports school (there are also counties where no sports school functions).

Regarding academic achievement, it is important to note that the National Competency Measurement does not allow the separation of sports classes within the sports schools and these data cannot be retrieved due to personal rights. Thus, we can provide a picture of rather the whole institution instead of the efficacy or inefficiency of the sports classes. We tried to reach this through controlling the variables such as competitive sport, however, we could earn a completely reliable image if we could separate the different classes within the

database or we could combine the individual competency values of the database with the individual health-awareness data per person. However, this is also a guideline for National Competence Measurement: the examination of health awareness is important for the longitudinal examination of health and academic achievement, for a deeper exploration of the relationships and for the creation of prevention activities.

All in all, however, the research significantly contributes to the accurate mapping of the operational efficiency of the sports school system introduced in 2012, to explore the characteristics of the students and to compare them with the characteristics of their peers at national level through interpreting the territorial differences. The relevance of the research questions formulated in the investigation is unquestionable and the continuation of the research is justified in order to improve the operational efficiency of the system and to ensure the stable academic and non-academic achievement.



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Candidate: Karolina Eszter Kovács
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List of publications related to the dissertation

Hungarian book chapters (4)

1. **Kovács, K. E.**, Szigeti, F.: A serdülők egészségmagatartásában szerepet játszó rizikó- és protektív faktorok áttekintése.
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17. **Kovács, K. E.**: The characteristics and territorial distribution of health-behavioural clusters among students.
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List of other publications

Hungarian books (1)

18. **Kovács, K. E.**: Fedezd fel a világot! Természettudományos kísérletek gyerekeknek. Kocka Kör, Debrecen, 152 p., 2014. ISBN: 9786155267062

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19. **Kovács, K. E.**, Markos, V., Rábai, D., Szűcs, T.: Az oktatási intézmény szerepe a családon belüli válságok kezelésében egy kvalitatív vizsgálat tükrében.
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20. **Kovács, K. E.**: Megéri gondozni a tehetségeket? Avagy: a Nemzeti Tehetség Program specifikus és aspecifikus társadalmi hatásaival kapcsolatos jövőkép.
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21. **Kovács, K. E.**, Szekér, B., Kondé, Z., Nagy, B. E.: A nemfigyelési vakság jelensége a sportpályán.
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23. Munkácsi, B., Papp, G., Felszeghy, E. N., Nagy, B. E., **Kovács, K. E.**: The associations between mental health, health-related quality of life and insulin pump therapy among children and adolescents with type 1 diabetes.

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DOI: <http://dx.doi.org/10.1515/jpem-2018-0130>

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Other journal articles (1)

24. Markos, V., **Kovács, K. E.**: Hajnalka Fenyves (ed.) (2015). Volunteering and new type of volunteering among the higher education students.

Hung. Educ. Res. J. 6 (3), 135-138, 2016. ISSN: 2062-9605.

Hungarian abstracts (1)

25. Kovács, K., **Kovács, K. E.**: Intézményi hatások a hallgatók sportolási szokásaiban.

In: A tanulás és nevelés interdiszciplináris megközelítése: XVI. Országos Neveléstudományi Konferencia. Szerk.: Zsolnai Anikó, Kasik László, SZTE BTK Neveléstudományi Intézet; MTA Pedagógiai Bizottság, Szeged, 151, 2016. ISBN: 9789633065136

Total IF of journals (all publications): 1,408

Total IF of journals (publications related to the dissertation): 0,322

The Candidate's publication data submitted to the iDEa Tudóstér have been validated by DEENK on the basis of Web of Science, Scopus and Journal Citation Report (Impact Factor) databases.

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