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Analysis of Physical Activity and Sedentary Behaviour of Students at the University of Zagreb—Importance of the Compulsory Subject: Physical and Health Culture (60th Anniversary of Tradition)

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Abstract

Introduction: According to a study conducted among students in Zagreb, despite sufficient awareness among students of the importance of physical activity (PA) for health, there is an insufficient level of PA in general. The subject of Physical education and health culture among students is the only form of organised PA and physical exercise. At the University of Zagreb 64,669 students are enrolled, of which 1665 students are enrolled at the Faculty of Agriculture and 2541 students at the Faculty of Kinesiology. Both faculties have a certain number of hours for practical exercises in their study programmes. **Objective:** The aim of this study is to analyse and compare the PA and sedentary behaviour (SB) of students from the Faculty of Kinesiology and the Faculty of Agriculture at the University of Zagreb. **Method:** The Mann-Whitney U test was used to determine the differences between the students of the two faculties in terms of the level of PA and SB, as well as the differences by gender at the level of the error of statistical inference $p < 0.05$. **Results:** Almost 40% of agriculture students are insufficiently active (22.15% are not active but are thinking of starting, and 17.18% are students who have only participated in PE). Students in the Faculty of Agriculture spend an average of 3.84 hours per week (SD = 3.63) on sports and recreational activities, while students in the Faculty of Kinesiology spend twice as much time at 9.61 hours (SD = 5.12). Depending on the faculty, the students differed statistically significantly in their SB in terms of study time and time spent on the computer. In terms of gender, differences were found in SB for study time and time spent on the computer, but

for entertainment. **Conclusion:** The academic community is recognised as an appropriate place to educate students about the importance of PA and maintaining personal health. In order to determine recommendations for PA, SB, and the necessary hours of sleep that are optimal for the health of the student population, it is necessary to create a standardised questionnaire and conduct research on a larger sample of students.

Keywords

Physical and Health Culture, Recommendations, Health Benefits

1. Introduction

The University of Zagreb celebrated the 60th anniversary of the compulsory subject "Physical and Health Culture". The first faculty to include physical education (PE) as a compulsory subject in the curriculum was the Faculty of Engineering in the academic year 1963/1964, mainly due to the lack of physical strength and endurance required of students in the practical exercises of the programme. In academic year 2000/2001, when the university changed and redesigned its study programme in view of the Bologna Declaration, some faculties of the university proposed to introduce PE as an elective subject. Due to the very worrying health picture resulting from the data of the annual medical examinations and the lack of physical activity (PA) (80% of the study participants state that they only participate in PE classes). The subject of Physical and Health Culture (since 2000) has retained its status as a compulsory subject for first and second-year students, with the possibility of taking it or sport as an elective subject in the higher year of study (Statute of the University of Zagreb, 2000: p. 21; 2015: p. 22). Since 2010, several doctoral theses have been written on a representative sample of students (941 - 1,651 students) at the University of Zagreb (Ćurković, 2010; Pedišić, 2011, Čule, 2018; Babić, 2020). What were the most important results from these studies: 20.2% of students were active at the recommended level (3 times a week, at least 30 minutes) and the most active students came from the field of technical sciences (Ćurković, 2010); the percentage of insufficiently active university students in the Croatian population is between 39.1% and 44.9% (41.8% - 49.1% for female and 31.7% - 40.9% for male students; the level of PA is positively related to life satisfaction and various components of the health aspect of students' quality of life, most of which concern vitality and general health (Pedišić, 2011); the number of hours of sport or leisure training per week has a statistically significant positive correlation with satisfaction with physical appearance in male students, but not in female students; 42.11% of the participants in the first test did not fulfil the given PA recommendations but after the intervention in which co-operation was encouraged and social cohesion was created among the students, led to a statistically significant increase in the level of PA in the experimental group ((2,536 ± 2,492) MET/week) compared to the control group ((1,756 ± 1,805) MET/week), which contributed to the overall

health of the students (Čule, 2018). The amount of PA decreases significantly between adolescence and adulthood, and the transition period between adolescence and adulthood is crucial for the acquisition and maintenance of PA habits. In a study (Babić, 2020) conducted on 1,304 students at the University of Zagreb, 43.8% of students do not achieve the minimum level of PA necessary to achieve health benefits in their free time. The author proposes an analysis of the sedentary behaviour (SB) of students in order to reduce its share of total free time and increase PA. Attention needs to be focused on the reasons for students' lack of motivation to participate in regular PA and how to overcome the barriers that students cite as the main reason for insufficient participation in sports and leisure activities. Another suggestion is to find ways in which we can reduce the number of hours students spend sitting in their free time. The results of the above studies encouraged us to investigate how the levels of PA and SB differ in a sample of students who have compulsory courses in Physical and Health Culture and students in the Faculty of Kinesiology, where most of them are still actively involved in sports (from elite to recreational). The students from the Faculty of Agriculture were selected based on the quality of the implementation of the teaching process (practical exercises, health workshops, the faculty is the centre for professional practice for 5th-year kinesiology students).

An important period for maintaining or improving adolescents' PA levels is the transition from school to university, where the decline in PA levels is most pronounced (45.4% of students), especially among those who have changed their place of residence for their studies (Diehl & Hilger, 2016). Looking at the students, it is clear that they are exposed to stress almost daily in their faculty-related commitments. The COVID-19 pandemic in 2020 and 2021 has certainly further influenced the decline in PA levels and, at the same time, the prevalence of sedentary behaviour (SB) in most people (Stockwell et al., 2021). According to Yikealo et al. (2018), 71% of students reported that academic commitments cause them a moderate level of stress, 13% a high level of stress, and 16% a low level of stress. The authors Wunsch et al. (2017) investigated the effects of PA on sleep quality and the general well-being of students during the exam period and found a positive correlation between moderate intensity of PA and these areas.

All above mentioned a study conducted among students in Zagreb, despite sufficient awareness among students of the importance of PA for health, there is an insufficient level of PA in general, which led the above-mentioned authors to conclude that the issue of Physical education and health culture among students is also the only form of organised PA and physical exercise. One of the characteristics of the modern concept of assessment and quality assurance in the age of mass higher education is quality as expediency (Petrušić, 2017). The university environment is considered an ideal place and time where we can influence the change of young people's habits. Therefore, the purpose of compulsory Physical and Health Culture is justified, as we can inform students about the numerous positive effects of regular PA on health as part of teaching and encourage them to reflect and perhaps change their habits if they belong to the group that does not participate in PA or exercise programmes in

their free time, i.e., those who choose a sedentary lifestyle.

It is important to point out that Physical and Health Culture is the only subject in the study programmes at the University of Zagreb that encourages students to be PA, to learn how to exercise properly in their free time, and to take care of their health. We thought it was important to determine the condition of kinesiology students (sports engagement and time spent on sedentary activities). We believe that as future promoters of healthy lifestyles and future physical education teachers throughout the education system (from preschool to university), they need to be a good example at the university.

At the University of Zagreb, the largest and oldest university in Croatia, 64,669 students are enrolled, 1665 of them at the Faculty of Agriculture and 2541 at the Faculty of Kinesiology. Both faculties include a certain number of hours for practical exercises and internships in their study programmes. For students in the Faculty of Kinesiology, this accounts for almost half of the total number of hours in the first three years of study, while students in the Faculty of Agriculture have compulsory Physical and Health Culture in the first two years of the undergraduate programme. After that, they can participate in various extracurricular sports activities, and electives in the fields of sports and agricultural practise (land management, various food production, horticulture, transport, and storage, etc.), depending on their study programme. The aim of this study is to analyse and compare the PA and SB of students from the Faculty of Kinesiology and the Faculty of Agriculture at the University of Zagreb.

2. Method

2.1. Sample

The sample consisted of 250 students from the Faculty of Agriculture and the Faculty of Kinesiology at the University of Zagreb in the academic year 2023/2024. All respondents are adults who gave their consent to participate in the survey before completing the questionnaire themselves. The conducted research was approved by the Ethics Committee of the Faculty of Kinesiology at the University of Zagreb.

2.2. Instrument

The study used the "KINAKT" questionnaire (Ćurković, 2010) on the level of engagement in kinesiological activities, which consists of three general and 18 specific questions covering a total of 53 variables. The feasibility and validity of the questionnaire were confirmed in the dissertation (Ćurković, 2010; De Privitellio, 2021). The general questions relate to age, gender, year, and level of study. Specific questions investigated the level of PA up to the age of 10, from the age of 10 until entering university, the current level of PA and sports participation (in the last week and month), the type of sports activity, how they spend their free time, how much time they spend sedentary and what activities they prefer. For most questions, answers were offered where students could only select one of the offered answers with which they could most closely identify.

2.3. Measurement Procedure

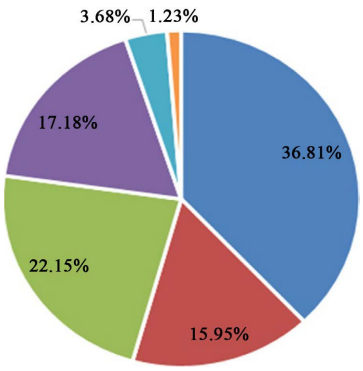
At the end of the summer semester in the year 2023/2024 (first week of June), the students of the Faculty of Agriculture and the students of the Faculty of Kinesiology received an invitation to participate in the study with a link to the online version of the questionnaire "KINAKT" (Google form). Before completing the questionnaire, the students were informed about the purpose of the survey, the instructions for completing it, and the anonymity of the questionnaire. The time required to complete the questionnaire was 8 - 10 minutes.

2.4. Methods

The data obtained from the questionnaire were processed in a spreadsheet programme (Microsoft Excel, 2022) and the statistical programme Statistica 14.0 for Windows. Descriptive statistical parameters were calculated and expressed as relative response frequencies. When checking the normality of the distribution using the Shapiro-Wilk W-test, the results indicated an abnormal distribution, so a non-parametric method, the Mann-Whitney U-test, was used to compare two groups of students from different faculties. The same test was used to compare the differences in the student population by gender.

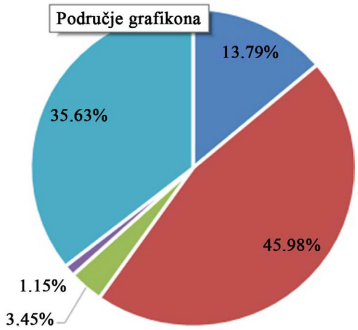
3. Results

250 students took part in the study. Of the total number of participants, 166 were female (66.4%) and 84 male (33.6%). The average age of the students was 20.7 years. These data indicate a relatively homogeneous age group, with the majority of students being in their first, second, and third year of study. In terms of the educational structure of the students, 87 students were studying at the Faculty of Kinesiology, representing 34.8% of the total sample. The remaining 163 students, i.e., 65.2%, studied at the Faculty of Agriculture. This diversity in the educational profiles of the students gives an insight into the attitudes and behaviours towards PA among students from different fields of study.



Legend: 1-2x per week; 3-4x per week; not at the moment, but I am thinking of starting to be more active; only Physical Education; 5x and more per week; I do not exercise, and I am not planning to start.

Figure 1. Level of PA for AGR students.



Legend: 1-2x per week; 3-4x per week; not at the moment, but I am thinking of starting to be more active; only Physical Education; 5x and more per week; I do not exercise, and I am not planning to start.

Figure 2. Level of PA for KIN students.

Table 1. Comparison of the average weekly number of hours spent on sports and leisure activities between faculties (Mann-Whitney U-test).

N		X		MIN		MAX		SD		Z–value	*p*
AGR	KIN	AGR	KIN	AGR	KIN	AGR	KIN	AGR	KIN		
163	87	3.84	9.60	0	-9.49	30	30	3.63	5.12	−9.49	**0.00**

Legend: N: Number of Students; AGR: Faculty of Agriculture; KIF: Faculty of Kinesiology; X: Arithmetic Mean; MIN: Minimum; MAX: Maximum; SD: Standard Deviation;*$p < 0.05$.

Students in the Faculty of Agriculture spend an average of 3.84 hours per week (SD = 3.63) on sports and leisure activities, while students in the Faculty of Kinesiology spend 9.61 hours (SD = 5.12), with a Z-score of 9.49 and a statistically significant difference in the arithmetic group mean ($p = 0.00$) (**Table 1**). De Privitellio (2021) found a lower average number of hours per week in PA compared to the kinesiology students, but the same arithmetic mean as the agronomy students (3.85) with a lower standard deviation (0.68). Although we do not have information on the intensity of PA performed from the previous two questions, based on the proportion of students who performed 4 or more at least half-hour PA per week, we can assume that 24.80% of students fulfill the WHO recommendations for the recommended weekly levels and duration of PA (at least 150 to 300 minutes of moderate-intensity aerobic activity or 75 to 150 minutes of vigorous-intensity aerobic activity) (WHO, 2020). These values are lower than among students at the University of Rijeka, where 34.8% of them fulfill the prescribed recommendations (Hlača & Lulić Drenjak, 2022).

Table 2. Comparison of the average weekly number of hours spent on sport and leisure activities by gender (Mann-Whitney test).

N		X		MIN		MAX		SD		Z-value	*p*
M	F	M	F	M	F	M	F	M	F		
84	166	6.78	5.98	0	0	30	30	5.09	8.90	2.60	0.01

Legend: N: Number/Gender; M: Male; F: Female; X: Arithmetic Mean; MIN: Minimum; MAX: Maximum; SD: Standard Deviation; *$p < 0.05$.

Analyzing the results of current activity levels revealed that 36.81% of agronomy students are active 1 - 2 times per week, 25.15% of agronomy students are in the consideration phase (not currently doing anything but thinking about starting and engaging in some form of PA); 17.18% only participated in sports, and 15.95% of students are active 2 - 4 times per week. A minority of agronomy students are active more than 5x per week. Compared to the current PA level of kinesiology students, 45.98% were active 3 - 4 times per week, and 36.63% were active more than 5x per week (Figure 1 and Figure 2).

Analysis of the responses regarding current sports involvement showed that 88.80% of agronomy students and 33.33% of kinesiology students do not participate in sports. Of the agronomy students who participated in sports, 9.20% are members of the university sports team, while the expected higher number, 19.54% of kinesiology students, are members of the university team. The majority of agronomy students (39.62%) participated in sports and recreational activities only 5 times per month, while the majority of kinesiology students (40.23%) participated more than 20 times per month. It is worrying that almost 16% of agronomy students did not participate at all. We can also see the differences in PA in the last week. Of the active agronomy students in June 2023, when we provided the study, 27.61% were active 4x in the last week of May, compared to 55.17% of kinesiology students. In that week, only 15.34% of agronomy students were active 3x, compared to 26.44% of kinesiology students. 9.20% of agronomy students and 4.50% of kinesiology students did not engage in any PA at all during the last week of May. The Mann-Whitney U-test revealed a statistically significant difference in the arithmetic mean between the faculties and in relation to gender (Table 3).

Table 3. Comparison of the answers to questions on PA between the faculties and in relation to gender (Mann-Whitney U-test).

	Faculties		Gender	
Variables	Z-value	*p*	Z-value	*p*
Current level of PA	−9.07	0.00*	2.72	0.01*
Current involvement in sport	−7.09	0.00*	2.46	0.01*
Participation in a sport/leisure activity for at least 30 minutes in the last MONTH	−8.48	0.00*	2.31	0.02*
Participation in a sport/leisure activity for at least 30 minutes in the last WEEK	−8.72	0.00*	2.02	0.04*

*$p < 0.05$.

Sedentary activities that kinesiology and agronomy students spend more hours on and could be reduced include sitting in front of the computer for entertainment and sitting with friends. The largest percentage of agronomy students (22.7%) spend 1 hour on the computer for entertainment, while 20.25% spend 2 - 3 hours. The highest percentage of kinesiology students do not sit for pleasure at all (26.44%), up to 22.99% spend up to 1 hour, and 20.69% of 1 - 2 hours.

Compared to agriculture students (6.75%), most kinesiology students (9.20%) spend five or more hours per day in front of the computer for pleasure. Students in these two faculties differed, although not significantly, in how much time they spent with their friends: One-third of kinesiology students (35.48%) who participated in this study spent up to 1 hour, and 33.33% spent up to 2 hours, while one-third of agronomy students (35.58%) spent between 1 - 2 hours and 23.31% spent up to 1 hour. The highest percentage of agronomy students (7.98%) spending 5 or more hours on an activity is associated with sitting and hanging out with friends. Some of this time is hypothetically spent on social activities during breaks between lectures and on the way to and from university.

Table 4. Comparison of answers to questions on SB between the faculties and in relation to gender (Mann-Whitney U-test).

	Faculties		Gender	
Variables	Z-value	*p*	Z-value	*p*
How much time do you spend studying each day?	3.23	0.00*	−2,.8	0.01*
On average, how much time do you spend in front of the television each day?	0.42	0.68	1.25	0.21
On average, how much time do you spend in front of the computer each day to study?	3.96	0.00*	−1.24	0.21
On average, how much time per day do you spend in front of the computer having entertainment (e-games, surfing, chatting)?	0.81	0.42	2.23	0.03*
How much time per day do you spend on additional education (foreign languages, lessons, courses...)?	0.15	0.88	0.59	0.55
How much time per day do you read books for fun and relaxation?	1.79	0.07	−1.52	0.13
How much time per day do you spend on a hobby or playing a musical instrument?	0.39	0.61	1.47	0.14
How much time do you spend sitting and talking with friends per day?	1.43	0.15	−1.83	0.07
How much time do you spend walking in shopping centres and other shops per day?	2.05	0.04*	−2.00	0.04*
On average, how much time per day do you spend lying down and listening to music?	1.64	0.10	−1.39	10.16

*$p < 0.05$.

Table 4 shows the differences in terms of faculty and gender. Depending on the faculty, the students differed statistically significantly in SB in relation to study time and time spent on the computer. With regard to gender, differences were found in SB in terms of study time and time spent on the computer, but not in terms of entertainment. Statistically significant differences were found between faculty and gender in terms of time spent shopping (shopping centres, etc.).

4. Discussion

The academic community is recognised as an appropriate place to educate students about the importance of PA and maintaining personal health. Most European universities provide their students with a high-quality and accessible sports infrastructure and run prevention programmes to raise students' awareness of the importance of PA and personal health (FISU Healthy Campus, 2010). Before discussing the results of this study, it is important to point out that the main barriers among students at the University of Zagreb conducted by the studies are the availability of sports facilities, lack of time, energy, and motivation, as well as for some students lack support from the environment (Čudina-Obradović, 2008; Caput-Jogunica, 2023).

Based on the results presented in this study, it is clear that the students in the Faculty of Kinesiology are more active than the students in the Faculty of Agriculture, just as the male students in both faculties are more active than the female students in Kinesiology and Agronomy.

As mentioned in the introduction, the percentage of insufficiently active university students in the Croatian population is between 39.1% and 44.9%. According to the results of this study, almost 40% of agricultural students are insufficiently active (22.15% are not active but are thinking of starting, and 17.18% are students who have only participated in physical education classes). These students should be the target group for faculty professors of Physical and Health Culture. According to Keating et al. (2005), students who participate in sports regularly during their studies remain active as adults. Sparling and Snow (2002) found that 84.7% of students who exercised regularly during their studies maintained their exercise habits over the next 5 - 10 years, while 81.3% of students who were inactive during their studies maintained a sedentary lifestyle.

Students in the Faculty of Agriculture spend an average of 3.84 hours per week (SD = 3.63) on sports and leisure activities, while students in the Faculty of Kinesiology spend twice as much, namely 9.61 hours (SD = 5.12). Lopez-Valenciano et al. (2021) compared the results of studies conducted on the student population regarding the level of PA before and after the COVID-19 pandemic. A statistically significant decrease in PA was found in numerous studies, a decrease in low to moderate walking intensity was found in 5 of the 10 studies analysed, and a decrease in vigorous PA was found in 7 studies. The author of the studies mentioned in the introduction proposes an analysis of the SB of students with the aim of reducing their share of total free time and increasing PA. Attention needs to be focused on the reasons for students' lack of motivation to participate in regular PA and how to overcome the barriers that students cite as the main reason for not engaging sufficiently in sports and leisure activities. Another suggestion is to find ways in which we can reduce the number of hours students spend sitting in their free time (6-9% of students in this study spend 5 or more hours per day in front of the computer for pleasure).

Croatian 24-Hour Guidelines for Physical Activity, Sedentary Behaviour,

and Sleep—Implementation in the Academic Community

Jurakić & Pedišić (2019) point out the need to base public health recommendations on the integration of PA and the reduction of SB, to which is added a recommendation for the length of sleep as an inseparable part of the 24-hour daily cycle. The total time spent on PA, SB, and sleep is always 24 hours per day, so the three behaviours mentioned above are undeniably interdependent factors. To achieve health benefits, an optimal combination of PA, SB, and sleep is required (Chastin et al., 2015; Pedišić et al., 2017). The WHO accepts the proposed approach when formulating recommendations. The first proposal of the Croatian 24-hour recommendations for people aged 18 to 64 years for PA, SB, and sleep (2019), in addition to the already very well-known WHO recommendations (150-300 moderate-intensity PA or 75.150 vigorous-intensity PA and muscle-strengthening activities 2x per week), are:

- that aerobic activities are evenly distributed throughout the week and that each episode of activity lasts at least 10 minutes without interruption;
- the recommended level of PA can be achieved through leisure activities, but also in other areas of daily life, although it is important that you do not overdo it with constant standing or low-intensity PA;
- frequent alternation between sitting and standing activities and low-intensity PA is recommended for SB;
- SB time in front of the TV should be limited to no more than 3 hours per day;
- people with SB occupations should complete 2-4 hours of static standing and/or low-intensity PA;
- 7 - 9 hours of sleep per day is recommended.

As part of the Physical and Health Culture curriculum, students acquire basic theoretical and practical kinesiological knowledge of intensity dosage and conditioning of strength exercises for large muscle groups that meet proposed national guidelines. The basic knowledge of kinesiology can help students overcome crisis situations and maintain an appropriate level of exercise and health. Considering the proposal of the Croatian 24-hour recommendations on SB, we should recommend at university level to change the times of sitting and standing and the low-intensity activities that students and professors can perform (for example, discussions in standing groups) or in the breaks of lectures.

In addition to the main goal of Physical education and health culture at the University of Zagreb, which focuses on teaching knowledge and skills for training in leisure time, we can use the Croatian 24-hour recommendation for PA, SB, and sleep to inform students and motivate them to implement it in everyday life. In addition, we should use it to design messages for public health campaigns and for institutional health policy development. After 60 years of compulsory subjects at the University, it is important to emphasize the University's support, which is mainly focused on academic sport and the promotion of the University through sport. Over the last ten years, the University, together with some faculties, has created a plan to develop the campus and sports infrastructure to help young people become more active and

spend more time in new and modern sports facilities.

5. Conclusion

PA is a term that is becoming more and more significant and important. Although awareness of the benefits of PA is increasing in the population and in the health sector, on the other hand, there is a growing number of overweight and physically inactive people. This negative trend affects all age groups, from children to the elderly. Studies conducted among students in Croatia and worldwide show different percentages of respondents who are physically active or fulfill the WHO recommendations, mostly between 40 and 50%. The results of this study show the percentage of students in the Faculty of Agriculture and Kinesiology who are physically active or sedentary and whether there is a difference between these populations and how they spend their free time. It was expected that students in the Faculty of Kinesiology would be more active and that male students would spend more time on PA than female students, which was confirmed with a statistically significant difference (p between 0.00 and 0.04). The same results were obtained by Horvat et al. (2013) and Škovran et al. (2020). In order to determine recommendations for PA, SB, and the necessary hours of sleep that are optimal for the health of the student population, it is necessary to create a standardised questionnaire and conduct research on a larger sample of students.

Limitations of the Study

The study has the limitation that it only analysed two faculties at the University of Zagreb. With this study, we have confirmed the results of previous studies conducted on a sample of students from Croatian universities. As there are no studies analysing PA, SB, and sleep in the student population, it is suggested that they are conducted in order to develop the proposed recommendations and use them in the development of university health policy.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

Babić, J. (2020). *Psihološki čimbenici tjelesne aktivnosti studenata Sveučilišta u Zagrebu*. Doktorska disertacija. Zagreb. Kineziološki fakultet Sveučilišta u Zagrebu. Repository of Faculty of Kinesiology, University of Zagreb. https://kif.zaki.com.hr/pagesResults/rezultati.aspx?searchById=10&xm0=1&spid0=10&spv0=Babi%c4%87%2c+Janko

Caput-Jogunica, R. (2023). Peer Support of Students of Kinesiology in Overcoming Barriers of Physical Inactivity of Students. In Leko (Ed.), *Monitoring System for the Physical Fitness of Children and Youth* (pp. 90-95). Croatian Kinesiology Association.

Chastin, S. F. M., Palarea-Albaladejo, J., Dontje, M. L., & Skelton, D. A. (2015). Combined Effects of Time Spent in Physical Activity, Sedentary Behaviors and Sleep on Obesity and Cardio-Metabolic Health Markers: A Novel Compositional Data Analysis Approach. *PLOS ONE, 10,* e0139984. https://doi.org/10.1371/journal.pone.0139984

Čudina-Obradović, M. (2008). Spremnost za školu: Višestrukost značenja pojma i njegova suvremena uporaba. *Odgojne Znanosti, 10,* 285-300.

Čule, M. (2018). *Društveni kapital i tjelesna aktivnost: Učinci skupnoga vježbanja u sveučilišnoj nastavi tjelesne i zdravstvene kulture*. Doktorska disertacija, Sveučilište u Zagrebu, Kineziološki fakultet. Društveni kapital i tjelesna aktivnost|Repository of Faculty of Kinesiology, University of Zagreb.

Ćurković, S. (2010). *Kineziološke aktivnosti i rizična ponašanja studenata*. Doktorska disertacija, Kineziološki fakultet Sveučilišta u Zagrebu. Kineziološke Aktivnosti i Rizična Ponašanja Studenata.

De Privitellio, S. (2021). *Kineziološka aktivnost i samoprocjena kvalitete života studenata*. Doktorska disertacija, Kineziološki fakultet Sveučilišta u Zagrebu.

Diehl, K., & Hilger, J. (2016). Physical Activity and the Transition from School to University: A Cross-Sectional Survey among University Students in Germany. *Science & Sports, 31,* 223-226. https://doi.org/10.1016/j.scispo.2016.04.012

FISU Healthy Campus (2010) Healthy Campus Program. https://www.fisu.net/programmes/healthy-campus/

Hlača, E., & Lulić Drenjak, J. (2022). Tjelesna aktivnost studenata Sveučilišta u Rijeci. *Edukacija, Rekreacija, Sport, 31,* 41-44. https://doi.org/10.54478/ers.31.44.4

Horvat, M., Pukljak Iričanin, Z., & Jakuš, L. (2013). Redovitost tjelesne aktivnosti u populaciji studenata fizioterapije. *Medix: Specijalizirani medicinski dvomjesečnik, 19,* 261-263. https://hrcak.srce.hr/file/157101

Jurakić, D., & Pedišić, Ž. (2019). Croatian 24-Hour Guidelines for Physical Activity, Sedentary Behaviour, and Sleep: A Proposal Based on a Systematic Review of Literature. *Medicus, 28,* 143-153.

Keating, X. D., Guan, J., Piñero, J. C., & Bridges, D. M. (2005). A Meta-Analysis of College Students' Physical Activity Behaviors. *Journal of American College Health, 54,* 116-126. https://doi.org/10.3200/JACH.54.2.116-126

López-Valenciano, A., Suárez-Iglesias, D., Sanchez-Lastra, M. A., & Ayán, C. (2021). Impact of COVID-19 Pandemic on University Students' Physical Activity Levels: An Early Systematic Review. *Frontiers in Psychology, 11,* Article ID: 624567. https://doi.org/10.3389/fpsyg.2020.624567

Pedišić, Ž. (2011). *Tjelesna aktivnost i njena povezanost sa zdravljem i kvalitetom života u studentskoj populaciji*. Doktorska disertacija, Zagreb, Sveučilište u Zagrebu Kineziološki fakultet. Tjelesna aktivnost i njena povezanost sa zdravljem i kvalitetom života u studentskoj populaciji-CROSBI.

Pedišić, Ž., Dumuid, D., & Olds, T. S. (2017). Integrating Sleep, Sedentary Behaviour, and Physical Activity Research in the Emerging Field of Time-Use Epidemiology: Definitions, Concepts, Statistical Methods, Theoretical Framework, and Future Directions. *Kinesiology, 49,* 252-269.

Petrušić, I. (2017). *Razvoj metodologije i modela rangiranja visokih učilišta u Republici Hrvatskoj*. Doktorska disertacija, Zagreb, Sveučilište u Zagrebu Filozofski fakultet.

Škovran, M., Cigrovski, V., Čuljak, K., Bon, I., & Očić, M. (2020). Razina tjelesne aktivnosti i dnevno sjedenje: Čimbenici sedentarnog načina života kod mladih. *Hrvatski Športsko-medicinski Vjesnik, 35,* 74-80. https://hrcak.srce.hr/clanak/364066

Sparling, P. B., & Snow, T. K. (2002). Physical Activity Patterns in Recent College Alumni. *Research Quarterly for Exercise and Sport, 73,* 200-205. https://doi.org/10.1080/02701367.2002.10609009

Statute of the University of Zagreb (2005) https://www.unizg.hr/fileadmin/rektorat/O_Sveucilistu/Dokumenti_javnost/Propisi/statut.pdf

Statue of the University of Zagreb (2015) https://www.unizg.hr/fileadmin/rektorat/O_Sveucilistu/Dokumenti_javnost/Propisi/statut_2016.pdf

Stockwell, S., Trott, M., Tully, M., Shin, J., Barnett, Y., Butler, L. et al. (2021). Changes in Physical Activity and Sedentary Behaviours from before to during the COVID-19 Pandemic Lockdown: A Systematic Review. *BMJ Open Sport & Exercise Medicine, 7,* e000960. https://doi.org/10.1136/bmjsem-2020-000960

World Health Organisation (2020). *WHO Guidelines on Physical Activity and Sedentary Behaviour: At a Glance*.

Wunsch, K., Kasten, N., & Fuchs, R. (2017). The Effect of Physical Activity on Sleep Quality, Well-Being, and Affect in Academic Stress Periods. *Nature and Science of Sleep, 9,* 117-126. https://doi.org/10.2147/nss.s132078

Yikealo, D., Tareke, W., & Karvinen, I. (2018). The Level of Stress among College Students: A Case in the College of Education, Eritrea Institute of Technology. *Open Science Journal, 3,* 1-18. https://doi.org/10.23954/osj.v3i4.1691