

ATTITUDES TOWARDS EXERCISE AND THE PHYSICAL EXERCISE HABITS OF UNIVERSITY OF ZAGREB STUDENTS

Zoran MILANOVIĆ¹, Goran SPORIŠ², Nebojša TRAJKOVIĆ¹, Dalibor VRAČAN³, Mirna ANDRIJAŠEVIĆ², Saša PANTELIĆ¹ and Mario BAIC²

¹ University of Niš, Faculty of Sport and Physical Education, Niš, Serbia

² University of Zagreb, Faculty of Kinesiology, Zagreb, Croatia

³ University of Zagreb, Faculty of Architecture, Zagreb, Croatia

Corresponding author:

Zoran MILANOVIĆ, PhD

Faculty of Sport and Physical Education, Černojevićeva 10a, 18000 Niš

e-mail: zoooro_85@yahoo.com

ABSTRACT

The aims of this research were to determine the importance that university students give physical activity, to distinguish those sport activities that university students prefer and would want to be involved in, and to determine the differences in attitude towards individual sports activities in regard to gender. The study was conducted using a sample of 190 (age 18 ± 1 year) randomly selected university students (108 females; 82 males) that are currently attending the first and second year of architecture and geodesy and who also attend physical education classes. The results showed that university students were very well informed about the importance of physical exercise and recreation. Nevertheless, when it came to their involvement in various sporting activities, the questionnaires showed that almost 57 % of the university students do not generally spend their time participating in any sports and recreational activities. On the other hand, statistically significant differences ($p < 0.00$) were found between men and women in terms of selection and participation in sport activities based on the completed questionnaire. Based on the obtained data, the university students were offered sport events consistent with sports trends, following the wishes and interests of specific groups with regard to gender.

Key words: sport participation, gender, sport events, student's PA

ODNOSI DO TELOVADBE IN NAVADE GLEDE TELESNIH DEJAVNOSTI ŠTUDENTOV UNIVERZE V ZAGREBU

IZVLEČEK

Cilji raziskave so bili ugotoviti, kakšen pomen študentje dajejo telesnim aktivnostim, razločiti, katere športne aktivnosti so študentom ljubše in v katere bi želeli biti vključeni, ter ugotoviti razlike v odnosu do posameznih športnih aktivnosti glede na spol. Študija je bila izvedena na vzorcu 190-ih (starost 18 ± 1 leto) naključno izbranih študentov (108 žensk, 82 moških), ki trenutno obiskujejo prvi in drugi letnik arhitekture in geodezije in ki hodijo tudi na telovadbo. Rezultati so pokazali, da so bili študentje zelo dobro obveščeni o pomenu telesne dejavnosti in rekreacije. Kljub temu pa je raziskava pokazala, da se v praksi skoraj 57 % študentov ne udeležuje nobenih športnih in rekreativnih dejavnosti. Po drugi strani pa je raziskava na podlagi izpolnjenih vprašalnikov pokazala tudi statistično pomembne razlike ($p < 0,00$) med moškimi in ženskami glede izbire in sodelovanja v športnih dejavnostih. Na osnovi pridobljenih podatkov so študentom ponudili športne prireditve v skladu s trendi v športnih aktivnostih, ki jih oblikujejo želje in interesi določenih skupin glede na spol.

Ključne besede: udeležba v športu, spol, športni dogodki, telovadba za študente

INTRODUCTION

Health is a dynamic process that is constantly changing throughout life. Modern society is characterized by a lack of physical activity. Due to our advanced technology, people spend less and less time doing physical work as they are slowly being replaced by machines. This lack of physical activity also has a significant impact on the general human health status (Mišigoj-Duraković et al., 1999). Many experts and the World Health Organisation recommend regular, daily exercise to compensate for the reduction in physical work with the aim to preserve and improve both psychological and physical abilities. Life-long habits learnt in childhood are often reflected in one's health status during adulthood, commonly appearing as the initial risk factors of many diseases (Tirodimos, Georgiou, Savvala, Karanika, & Noukari, 2009). It is therefore important to promptly begin tracking the habits and health statuses of such people. In recent years, the number of research studies (Carlson, 1995; Portman, 1995; Ennis, 1996; Koca, Asci, & Demirhan, 2005) regarding university students' attitudes towards physical education and a health-promoting lifestyle is constantly growing. University students make up a large portion of the youth population who are, admittedly, still susceptible to changes in the case of environmental influence.

Tirodimos, Georgiou, Savvala, Karanika and Noukari (2009) have indicated that university students are in the last stages in which they can develop healthy behaviors and good eating habits. Physical exercise programs for university students should be

designed to fulfill their leisure time, thus giving them the opportunity to develop a positive attitude toward physical exercise. This can contribute to the promotion and adoption of healthy lifestyles (Huddleston, Mertersdorf, & Araki, 2002). Unfortunately, the sedentary way of life has become predominant between university students as well (Gošnik, Bunjevac, Sedar, Prot, & Bosnar, 2002), so the minimum recommended physical activity affecting the health status could not be met even among students of medical science (Teczely, Tolnai, & Angyan, 2003). Instead of being primarily related to the promotion of a healthy and active lifestyle, in some American universities, physical activity has been given “a highly commercial, professional connotation” (American Association of University Professors, 2003).

Tiroidimos et al. (2009) found, in their study, that female university students exercise less than their male peers, but have a lower risk of obesity due to healthier nutrition. According to a study conducted at the Faculty of Agriculture (Caput-Jogunica & Čurković, 2007), 74 % of university students were not involved in any form of physical activity, while 20 % were involved recreationally (2 to 3 times a week). Only 0.6 % were involved in active exercise. Hasse, Steptoe, Sallis and Wardle (2004) compared the involvement in physical activities during leisure time among university students of 23 countries and found that there was a significant difference in terms of gender, where men were much more involved than females (28 % versus 19 %). Furthermore, the habits acquired during the period of mandatory physical education in school have a significant impact on the subsequent lifestyle and active participation in exercise of any kind should not be underestimated. Some research (Adams & Brynteson, 1992; Brynteson & Adams, 1993) showed that the high demands of the university lifestyle, in terms of regular participation in sporting events, had resulted in positive exercise habits lasting between 2 and 11 years after graduation.

One of the possible effective interventions to include a greater number of university students in exercise programs with a probable effectuation of a healthy lifestyle, besides promotion and motivation, is the introduction of new sporting activities. Cardinal, Jacques, and Levy (2002) have confirmed that university students easily accept new sporting activities included in the program. Along with the current technological development, new, modern sports and physical recreation activities have emerged that are more interesting to users since they can immediately see the effects of their training through an improved level of fitness and health status. This kind of feedback facilitates the development of a person's positive attitude towards physical activity, while also helping him/her to find their optimal physical activity.

At the university level, the importance of curricular courses, in terms of health and exercise, has been well documented, although the impact of such courses on university students' knowledge, skills, attitudes and habits remains unclear (Friesen & Hoerr, 1990; Sallis et al., 1999; Furber & Ritchie, 2000; Cardinal et al., 2002). The primary aim of this study was to identify the attitudes of university students towards physical exercise and their habits. The secondary aim was to identify sports preferences among undergraduate university students and to determine gender differences visible through these preferences.

METHODS

Subjects

The study was conducted in the 2009/2010 academic year during the winter semester. The sample included 190 randomly selected university students (age: 18 ± 1 years), freshmen and sophomores from the Faculty of Architecture and Faculty of Geodesy at the University of Zagreb, who attended their mandatory Physical Education classes. Out of the total number of participants, there were 108 females (35 first-year and 39 second-year university students of the Faculty of Architecture and 18 first-year and 16 second-year university students of the Faculty of Geodesy). There were 82 male university students, of which 18 were freshmen and 11 were sophomores of the Faculty of Architecture with 30 freshmen and 23 sophomores from the Faculty of Geodesy.

Participation in the research was voluntary and the participants could back out in any time. The protocol of the research was approved by the Ethical Committee of the Faculty of Kinesiology, University of Zagreb, according to the revised Declaration of Helsinki. All the participants received detailed instructions for filling out the anonymous questionnaires and the advantages of the research were explained to them.

Table 1: The importance of physical activity for architecture and geodesy university students.

Importance of PA	Number of university students	%	Cumulative
1	1	1	1
2	4	2	3
3	59	31	34
4	96	51	85
5	28	15	99

Note ("Importance of PA" column): 1 – Sport I would never, under any circumstances do; 2 – Sport I would do if there was no other option; 3 – Sport I am not sure I would like to do; 4 – Sport I would like to do; 5 – Sport I would prefer most to do; PA – physical activity

Procedure

To determine university students' attitudes towards teaching physical education (PE), we used a questionnaire which was valid for this study design and had been previously used (Haralambos & Holborn, 2002). The survey was conducted among the university students as a part of their regular PE classes during the second semester (Haralambos & Holborn, 2002). The questionnaire included 21 questions, each of them related to one type of sport. The participants were asked to indicate on a 5-point Likert

scale the extent to which they would like to be involved in each sport (1 – Sport I would never, under any circumstances do; 2 – Sport I would do if there was no other option; 3 – Sport I am not sure I would like to do; 4 – Sport I would like to do; 5 – Sport I would prefer most to do).

Statistical analyses

The data were processed by Statistica 6.0 for Windows. Descriptive statistics (frequencies, means and percentages) were used to show the obtained results. Gender differences were determined by *t*-test at the univariate level, and with the canonical discriminant analysis at the multivariate level. Statistical significance level was set at $p < 0.05$.

Table 2: The frequency of physical activity per week.

Frequency of PA practice per week	Number of university students	%	Cumulative
0	109	57	57
1	4	2	59
2	35	19	78
3	24	13	91
4	7	4	95
5	3	2	97
6	8	4	100

Note: PA – physical activity

Table 3: Female students orientations regarding the specific sport.

Variable	1	2	3	4	5
Running/walking/trekking (%)	28	26	26	12	8
Fitness drills/aerobics (%)	23	12	16	29	18
Gymnastics (%)	31	22	22	14	11
Sailing/windsurfing (%)	25	19	23	18	13
Handball (%)	25	28	23	14	9
Wrestling/judo/karate/boxing (%)	38	22	16	12	12
Soccer (%)	36	18	11	15	19
Volleyball (%)	20	19	19	24	17
Basketball (%)	21	25	20	19	13
Rugby (%)	57	19	9	9	5
Track-and-field (%)	40	19	21	12	7
Roller sports (%)	26	17	15	18	23
Swimming (%)	8	8	21	26	36
Bowling (%)	48	20	17	9	4
Diving (%)	22	11	17	22	26
Shooting/paintball (%)	17	9	23	23	28
Chess (%)	43	18	17	11	10
Tennis/table tennis (%)	14	16	25	24	20
Water polo (%)	35	23	22	13	5
Rowing/kayaking (%)	30	21	26	14	7
Dance (%)	20	13	15	20	31

Note: 1 – Sport I would never, under any circumstances do; 2 – Sport I would do if there was no other option; 3 – Sport I am not sure I would like to do; 4 – Sport I would like to do; 5 – Sport I would prefer most to do

RESULTS

The results shown in Table 1 indicate that university students are generally well informed about the importance of physical activity. In fact, only one university student out of 190 participants answered that physical activity is not important. Four university students (2 %) responded that they did not give much importance to physical activity, and 59 (31 %) university students believed that exercise was a matter of secondary importance. Out of all the university students included in the survey, 96 (51 %) considered exercise extremely important and 28 university students (15 %) could not live without daily physical activity.

Table 2 shows that 57 % of university students were not involved in any form of physical exercise outside school PE classes. Only 2 % of the university students were involved in some form of extracurricular physical activities once a week, while 40 % of them occasionally exercise 2 to 5 times a week. Only 4 % of the university students exercise every day.

Table 4: Male student orientations regarding the specific sport.

Variable	1	2	3	4	5
Running/walking/trekking (%)	18	20	23	21	15
Fitness drills/aerobics (%)	45	20	15	13	4
Gymnastics (%)	51	20	13	7	5
Sailing/windsurfing (%)	26	18	31	12	10
Handball (%)	21	28	24	15	11
Wrestling/judo/karate/boxing (%)	27	27	16	11	17
Soccer (%)	16	7	15	24	38
Volleyball (%)	22	21	20	24	12
Basketball (%)	13	26	15	32	11
Rugby (%)	39	22	15	13	7
Track-and-field (%)	31	17	22	17	10
Roller sports (%)	48	23	15	7	4
Swimming (%)	10	12	21	27	27
Bowling (%)	40	21	18	11	6
Diving (%)	27	9	21	20	21
Shooting/paintball (%)	16	9	20	18	35
Chess (%)	33	21	21	10	12
Tennis/table tennis (%)	13	12	27	29	17
Water polo (%)	23	24	28	15	6
Rowing/kayaking (%)	23	12	37	17	7
Dance (%)	45	20	15	9	9

Note: 1 – Sport I would never, under any circumstances do; 2 – Sport I would do if there was no other option; 3 – Sport I am not sure I would like to do; 4 – Sport I would like to do; 5 – Sport I would prefer most to do

It was found (Table 3) that most university students wanted to be involved in swimming (62 %). Also, dance (51 %), shooting/paintball (51 %), diving (48 %) and fitness drills/aerobics (47 %) were the activities that university students would mostly like to perform.

An interesting fact is, that gymnastics and roller sports had a negative rating among 71 % of the university students (Table 4). On the list of unpopular activities among the university students are also the following: fitness drills/aerobics and dance (65 %), rugby and bowling (61 %), and to a lesser extent wrestling/judo/karate/boxing and chess (54 %), and volleyball (49 %). On the other hand, soccer (62 %) was the most popular sport among the male university students. A high interest was recorded also for swimming (54 %), shooting /paintball (53 %), table tennis/tennis (46 %) and basketball (44 %).

Table 5: Percentages of student orientations regarding the specific sport.

Variable	1	2	3	4	5
Running/walking/climbing (%)	14	25	22	24	15
Fitness/aerobic (%)	6	6	18	41	29
Gymnastics (%)	16	23	28	18	15
Sailing/windsurfing (%)	24	20	18	22	16
Handball (%)	29	29	22	13	7
Wrestling/judo/karate/boxing (%)	46	18	16	13	7
Soccer (%)	51	27	8	8	6
Volleyball (%)	19	18	19	24	20
Basketball (%)	27	25	24	10	14
Rugby (%)	70	17	5	5	3
Track and field (%)	46	20	20	8	6
Roller sports (%)	10	12	15	26	37
Swimming (%)	6	6	20	25	43
Bowling (%)	55	19	16	7	3
Diving (%)	18	13	14	24	31
Shooting/paintball (%)	18	9	25	26	22
Chess (%)	51	17	14	11	7
Tennis/table tennis (%)	14	20	24	20	22
Water polo (%)	44	21	18	12	5
Padding/kayak (%)	35	28	19	11	7
Dance (%)	1	7	16	29	47

Note: 1 – Sport I would never, under any circumstances do; 2 – Sport I would do if there was no other option; 3 – Sport I am not sure I would like to do; 4 – Sport I would like to do; 5 – Sport I would prefer most to do

Female university students (Table 5) preferred to be involved in dance (76 %), fitness drills/aerobics (70 %), swimming (68 %) and roller sports (63 %). A great interest could be noticed for diving (55 %), shooting/paintball (48 %) and volleyball (44 %), while less attractive were rugby (87 %), soccer (78 %) and bowling (74 %), as well as chess (68 %), track-and-field (66 %), wrestling/judo/karate/boxing (64 %), rowing/kayaking (63 %) and volleyball (58 %). The results in Tables 3, 4 and 5 indicate significant gender differences in the attitudes towards and interests for individual sporting activities. To confirm this difference, discriminant analysis was used.

Table 6: Correlation between variables and discriminant function.

Variable	DF 1
Running/walking/climbing (%)	0.020
Fitness/aerobic (%)	0.521
Gymnastics (%)	0.293
Sailing/windsurfing (%)	0.064
Handball (%)	-0.062
Wrestling/judo/karate/boxing (%)	-0.112
Soccer (%)	-0.452
Volleyball(%)	0.079
Basketball (%)	-0.114
Rugby (%)	-0.223
Track and field (%)	-0.144
Roller sport (%)	0.495
Swimming (%)	0.118
Bowling (%)	-0.105
Diving (%)	0.087
Shooting/ paintball (%)	-0.056
Chess (%)	-0.101
Tennis/table tennis (%)	-0.014
Water polo (%)	-0.127
Padding/kayak (%)	-0.128
Dance (%)	0.626

The structure of the discriminant function is bipolar. The examined group of female university students is on the positive pole of the discriminant function, whereas the examined male group of university students is on the negative pole of the discriminant function.. The variables on the positive pole of the discriminant function, i.e. the ones describing the examined group of female university students, are: dance, fitness drills/aerobics, roller sports, gymnastics, swimming, diving, volleyball, sailing/wind surfing, running/walking/climbing. The variables that defined the negative pole of the discriminant function, i.e. the ones describing the examined group of male university students, are football, rugby, athletics, rowing/kayaking, water polo, basketball, wrestling/judo/karate/boxing, bowling, chess, handball, shooting/paintball and tennis/table tennis.

Table 7 shows a high canonical discriminant coefficient (0.811) that differentiates significantly between the two groups. In fact, statistically significant differences were found between female and male university students ($p < 0.00$). In sport activities such as dance, fitness drills/aerobics, roller sports, soccer, gymnastics, rugby, track-and-field, rowing/kayaking, water polo, wrestling/judo/karate/boxing, swimming, basketball and bowling the differences were obtained between the male and female subjects ($p < 0.05$), whereas no statistically significant difference was obtained in sports such as tennis/table tennis, jogging/walking/climbing, shooting/paintball, sailing/windsurfing, volleyball, handball, diving and chess.

Table 7: Discriminant analysis.

Value	Canonical Discriminant Function Coefficients	Wilks Lambda	χ^2 test	df	p
1.922	0.811	0.342	187.106	21	0.00

Table 8: Differences between male and female university students.

Variable	Mean (male)	Mean (female)	t-test	df	p
Running/walking/climbing	3.009	2.937	-0.374	185	0.709
Fitness/aerobic*	3.787	2.076	-9.832	185	0.000*
Gymnastics*	2.935	1.911	-5.534	185	0.000*
Sailing/windsurfing	2.852	2.608	-1.209	185	0.228
Handball	2.417	2.667	1.356	187	0.177
Wrestling/judo/karate/boxing*	2.176	2.638	2.261	186	0.025*
Soccer*	1.907	3.610	8.845	188	0.000*
Volleyball	3.102	2.840	-1.289	187	0.199
Basketball*	2.593	3.013	2.147	185	0.033*
Rugby*	1.537	2.253	4.197	185	0.000*
Track and field*	2.056	2.570	2.713	185	0.007*
Roller sports*	3.676	1.924	-9.336	185	0.000*
Swimming *	3.917	3.506	-2.229	185	0.027*
Bowling*	1.843	2.190	1.985	185	0.049*
Diving	3.352	2.987	-1.639	185	0.103
Shooting/paintball	3.259	3.500	1.153	186	0.250
Chess	2.074	2.456	1.904	185	0.058
Tennis/table tennis	3.176	3.247	0.366	187	0.714
Water polo*	2.111	2.544	2.403	185	0.017*
Padding/kayak*	2.278	2.722	2.404	185	0.017*
Dance*	4.139	2.127	-11.796	185	0.000*

Note: *statistically significant $p < 0.05$

DISCUSSION AND CONCLUSION

Only 6 % of the students included in the survey exercise according to the recommendations of the World Health Organization, although their awareness of the importance of physical exercise is at a high level (51 % of the subjects responded: "For me, it is very important to be involved in physical activity."). The paradoxical nature of the finding illustrates an alarming fact that almost 57 % of university students do not pay any attention to sports and physical recreation. Given the fact that university students

are expected to be prominent members of society and its future leaders, their health-related habits and physical activity levels are of particular interest.

One of the possible reasons is a very large number of academic requirements and home commitments related to studies. University students spend most of their time sitting at the computer desks doing their homework, so the amount of time that can be allocated to some other activities, especially to physical activities, is comprehensively reduced. It is also evident from the findings that the university students included in the survey are aware of and educated enough what regards the importance of physical activity and its impact on health, but due to time shortage and/or insufficient choice of PE classes, which are carried out only twice per week, very few of them are included in any organized form of physical exercise. In addition, the findings indicate distinct gender differences in PA or sporting activity preferences. Gender differences in the choice of physical activities have already been demonstrated in previous studies (Scully & Clark, 1997; Colly, Berman, & Van Millingen, 2005; Koca, Asci, & Demirhan, 2005), where team sports prevail among male university students with the predominance of soccer, while the female university students prefer to participate in individual and aesthetic sports (Hicks, Wiggins, Crist, & Moode, 2001).

Similar findings are also shown in our study where male university students were primarily oriented towards competitive sports, whereas an interest in active participation in non-competitive forms of PA prevailed among female university students. It is evident that girls are more than their male peers focused on the aesthetic components of the following sporting or physical activities: dance, fitness drills/aerobics, roller sports, gymnastics, swimming, diving, and volleyball. Such choice of activities for university students is in accordance with the gender role stereotypes about women's behavior and appearance. In this context, most of the activities selected by male university students can be explained; they have predominantly chosen physical contact or force sports practiced through competition.

Competitive sports and activities practiced in physical education classes can be used to promote physical activity and skill development, to build up character, and to prepare university students to live and work in a highly competitive environment (Goldstein & Iso-Ahola, 2006). However, their effect may be of a two-way nature. On one hand, competitive activities may, and they certainly do, stimulate interest for participation in certain activities, but only in physically well-prepared and skilled university students. On the other hand, these activities will turn away those with poor abilities or skills due to their feelings of incompetence or inferiority to others (Portman, 1995).

Since this study did not include all the University of Zagreb students, the inferences should be taken with caution. In the future line of research, the attitudes towards physical exercise, behaviors and habits of other university students with various academic pursuits should be examined. Considering mental and physical loads of academic programs from which much of psycho-emotional stress arises, as well as lack of free time which is directly linked to lack of time that could be allotted to physical exercise, it would be interesting to follow up health status of the students included in the survey some time after the survey has been conducted.

In contrast to the previous research (Carlson, 1995), the participants in the current study expressed their interest in PE classes during the time of their study, but they were also interested in a new curriculum. Based on the findings, it would be sensible to offer attractive sporting programs to university students, consistent with current trends in sport and following wishes and interests of gender-defined groups of university students. It is expected that such sport activities will achieve the best results in terms of activating and encouraging university students to embrace various forms of physical exercise and engage in various programs of sport activities. The findings also make it evident that there is a strong need for separate sporting and physical recreation with gender-specific program contents. This information should be greatly appreciated when PE curriculum is planned and delivered at universities. Eventually, this would lead to the separation of physical and health education courses and classes in relation to gender, and consequently, to the formation of homogeneous groups as regards preferences, abilities and skills.

REFERENCES

- Adams, T. M., & Brynteson, P. (1992).** A comparison of attitudes and exercise habits of alumni from universities with varying degrees of physical education activity programs. *Research Quarterly for Exercise and Sport*, 63, 148–152.
- American Association of University Professors (2003).** Policy Statement: Contingent Appointments and the Academic Profession. Washington, DC: The American Association of University Professors.
- Brynteson, P., & Adams, T. M. (1993).** The effects of conceptually based physical education programs on attitudes and exercise habits of university alumni after 2 to 11 years of follow-up. *Research Quarterly for Exercise and Sport*, 64, 208–212.
- Caput-Jagunica, R., & Kučinić, I. (2001).** Stanje i perspektive tjelesne i zdravstvene kulture i sporta na Sveučilištu u Zagrebu. In D. Milanović (Ed.), *Zbornik radova „Stanje i perspektive zagrebačkog sporta“* (pp. 167–173). Zagreb: Fakultet za fizičku kulturu.
- Cardinal, B. J., Jacques, K. M., & Levy, S. S. (2002).** Evaluation of a university course aimed at promoting exercise behavior. *Journal of Sports Medicine and Physical Fitness*, 42, 113–119.
- Carlson, T. B. (1995).** We hate gym: University student alienation from physical education. *Journal of Teaching in Physical Education*, 4, 467–477.
- Colley, A., Berman, E., & Van Millingen, L. (2005).** Age and gender differences in young people's perceptions of sport participants. *Journal of Applied Social Psychology*, 35(7), 1440–1454.
- Coput Jogunica, R., & Ćurković, S. (2007).** Indeks tjelesne aktivnosti i fitness samoprocjena studenata Agronomskog fakulteta Sveučilišta u Zagrebu. In M. Andrijašević (Ed.), *Zbornik radova „Sport za sve u Funkciji unaprjeđenja kvalitete života“* (pp. 319–326). Zagreb: Kineziološki fakultet.
- Ennis, C. D. (1996).** University students' experiences in sport-based physical education: (More than) apologies are necessary. *Quest*, 48, 453–456.

- Findak, V. (1999).** Metodika tjelesne i zdravstvene kulture. Zagreb: Školska knjiga.
- Flander, M., Rakoci, D., Jajčević, Z., & Peruza-Krušić, B. (Eds.) (1984).** Sportski leksikon. Zagreb: Jugoslavenski leksikografski zavod "Miroslav Krleža".
- Friesen, C. A., & Hoerr, S. L. (1990).** Nutrition education strategies for worksite wellness: Evaluation of a graduate course targeted to worksite wellness majors. *Journal of the American Dietetic Association*, 90, 854–856.
- Fučkar, K., & Dijaković, T. (2001).** Analiza stavova i interesa prema sportu studenata Prirodoslovno-matematičkog fakulteta u Zagrebu. In V. Findak (Ed.), *Zbornik radova „10. ljetne škole pedagoga fizičke kulture Republike Hrvatske“* (pp. 114–119). Zagreb: Hrvatski savez pedagoga fizičke kulture.
- Furber, S. E., & Ritchie, J. E. (2000).** Spreading the word: Teaching health promotion to university students from disciplines other than health. *Education for Health*, 13, 329–336.
- Goldstein, J., & Iso-Ahola, S. E. (2006).** Promoting sportsmanship in youth sports: Perspectives from sport psychology. *Journal of Physical Education Recreation & Dance*, 77(7), 18–25.
- Gošnik, J., Bunjevac, T., Sedar, M., Prot, F., & Bosnar, K. (2002).** Sport experience of undergraduate university students. In D. Milanović, & F. Prot (Ed.), *Proceedings of 3rd International Scientific Conference, "Kinesiology - New Perspectives"* (pp. 457–461). Zagreb: Faculty of Kinesiology.
- Haralambos, M., & Holborn, M. (2002).** Sociologija – teme i perspektive. Zagreb: Golden marketing.
- Hasse, A., Steptoe, A., Sallis, J. F., & Wardle, J. (2004).** Leisure-time physical activity in university students from 23 countries: Associations with health beliefs, risk awareness and national economic development. *Preventive Medicine*, 39, 182–190.
- Hicks, M. K., Wiggins, M. S., Crist, R. W., & Moode, F. M. (2001).** Sex differences in grade three university students' attitudes toward physical activity. *Perceptual and Motor Skills*, 93, 97–102.
- Huddleston, S., Mertersdorf, J., & Araki, K. (2002).** Physical activity behavior and attitudes towards involvement among physical education, health, and leisure services pre-professionals. *University Students Journal*, 36(4), 555.
- Koca, C., Asci, F. H., & Demirhan, G. (2005).** Attitudes toward physical education and class preferences of Turkish adolescents in terms of school gender composition. *Adolescence*, 40(158), 365–370.
- Mišigoj-Duraković, M. (1999).** Tjelesno vežbanje i zdravlje. Zagreb: Grafos.
- Portman, P. A. (1995).** Who is having fun in physical education classes? Experiences of sixth grade university students in elementary and secondary schools. *Journal of Teaching in Physical Education*, 14, 445–453.
- Sallis, J. F., Calfas, K. J., Nichols, J. F., Sarkin, J. A., Johnson, M. F., Caparosa, S., et al. (1999).** Evaluation of a university course to promote physical activity: Project GRAD (Graduate Ready for Activity Daily). *Research Quarterly for Exercise and Sport*, 70, 1–10.
- Scully, D., & Clarke, J. (1997).** Gender issues in sport participation. In J. Kremer, K. Trew, & S. Ogle (Eds.), *Young people involvement in sport* (pp. 25–56). London: Routledge.

- Tecely, T., Tolnai, C. K., & Angyan, L. (2003).** Physical activity and medical condition of university students. Book of Abstracts of 8th Annual Congress of the ECSS, Salzburg (p. 434).
- Tiroidimos, I., Georgouvias, I., Savvala, T. N., Karanika, E., & Noukari, D. (2009).** Healthy lifestyle habits among Greek university students: Differences by sex and faculty of study. *East Mediterranean Health Journal*, 15(3), 722–728.