

CORRELATION BETWEEN PHYSICAL ACTIVITY AND SELF ESTEEM IN FEMALE STUDENTS OF THE UNIVERSITY OF ZADAR

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Original scientific paper

Abstract

The aim of this study was to determine the overall level of university students' physical activity and the level of different type of the physical activity concerning intensity of the activity (walking, moderate intensity, high intensity). Furthermore, the goal was to find out the level of students' self-esteem. Also, the purpose was to explore relations between physical activity and self-esteem. Survey data collection was conducted on a sample of 312 female students from the University of Zadar. Physical activity level was assessed using the International Physical Activity Questionnaire (IPAQ) - long form, and self-esteem was assessed using the Rosenberg self-esteem scale (RSES). Concerning the obtained results, the greatest energy consumption was gained by walking. Furthermore, students have the highest percentage of high self-esteem. Moreover, the Spearman's rank correlations indicate that the student's moderate physical activity correlated with self-esteem. The evidence on the positive relationship of physical activity with self-esteem can potentially be used to support evidence-based promotion of physical activity in a university setting.

Key words: physical activity, intensity, self-esteem, university students.

Introduction

Physical activity involves all movement, i.e. everyday movement of a person, including business, recreation and sports activities and it is categorized, according to the level of intensity, from low through moderate to high intensity physical activity (Pan American Health Organisation, 2002). Insufficient physical activity is defined as a condition where there is no significant increase in energy expenditure above the level of inaction (Hagstrom, Oja and Sjostrom, 2007). Physical activity has a positive effect on the self-perception of physical appearance and physical fitness but also on the level of overall self esteem (Bertollo, Sassi and Carraro, 2005), while moderate physical activity can have a positive effect on the self esteem and mood of adolescents (Wood, Angus, Pretty, Sandercock and Barton, 2013). Self esteem represents the central aspect of self-concept; it is the evaluative aspect of self-concept. It denotes the degree of the overall sense of value and virtue that a person has about him or herself (Baumeister, 1998). According to Rijavec and Miljković (2001), the self-esteem is the valuable and emotional component of the self-concept. To explain the mechanism behind the correlation of physical activity and self-esteem we can observe "The exercise and self-esteem model-EXSEM" (Sonstroem, Harlow, and Josephs, 1994 and Sonstroem and Morgan, 1989). According to this model, the positive changes in physical parameters as a result of physical activity hypothetically lead to increased perceived self-efficacy. Increased self-efficacy hypothetically leads to increased self-perception in various subdomains of physical abilities and characteristics which further leads to increased overall evaluation of physical abilities and characteristics.

Self-efficacy can function on parallel level as the results obtained through exercising in that it can indirectly, through subdomains, increase the evaluation of physical abilities and characteristics and the overall self-esteem (McAuley, Blissmer, Katula, Duncan and Mihalko, 2000 and McAuley et al., 2005). The changes in physical parameters have their role in the impact of physical activity on the overall self-esteem (Spence, McGannon and Poon, 2005) and they moderate the impact of physical activity on the self-concept component in the domain of physical self-concept (Schneider, Dunton and Cooper, 2008). The existing research shows that physical activity enhances social benefits, self-esteem, the self-perception of physical appearance and physical abilities of adolescents and that the positive effects are greater among those adolescents who initially had lower self-esteem (Biddle and Asare, 2011). With respect to intensity of physical activity, the research has shown the positive correlation between self-esteem, the overall physical activity and the physical activity of moderate intensity (Hawker, 2012). The aim of this study is to investigate the existence of statistically relevant correlation between physical activity and self-esteem of female students.

Methods

The study was conducted on a convenience sample of 312 female students from the University of Zadar (Mean=21.68 years, SD=1.54 years). In order to assess the level of physical activity the International Physical Activity Questionnaire (IPAQ International Consensus Group, Craig et al., 2003) was used.

The questionnaire consists of 27 questions that investigate the frequency and duration of walking activities, of physical activity of moderate intensity and of physical activity of high intensity. By summing up of the results obtained through the questionnaire the overall level of physical activity was calculated. The results were expressed as MET minutes units of measurement for each type of activity individually and also for the overall level of physical activity. The Rosenberg Self-Esteem Scale - RSES (Rosenberg 1965; Bezinović, 1988) was used to assess the level of self-esteem. This scale measures the overall value orientation towards self or self-respect. It consists of 10 statements.

The total result is obtained by simple summing up of assessments on the 4 Point Likert type scale. The higher result denotes higher self-esteem. The study was conducted in the period from January 9 to February 3 2012 and it was approved by the Committee for scientific research and ethics of the Faculty of Kinesiology of the University of Zagreb. Normality of distribution of variables was tested with the use of Kolmogorov-Smirnov test.

The correlation between the overall physical activity and physical activity of various intensity and self-esteem was determined by using Spearman correlation coefficient. The data were processed using the application package STATISTICA, version 7.1., StatSoft, Inc. (2005).

Results and discussion

The results of Kolmogorov-Smirnov test have demonstrated that distributions of the results depart significantly from normal distribution and that they are positively asymmetric and leptokurtic to various degree (Table 1). The median overall level of physical activity of female students is 64.75 MET- hours/week, which is approximately 3.23 hours of moderately intensive physical activity five days a week or 1.62 hours of highly intensive physical activity five days a week or some equivalent combination of moderate and high intensity activity. The lower quartile of the overall level of physical activity among female students from the University of Zadar is 36MET-hours/week while the upper quartile is 115.18MET- hours/week.

Table 1. Descriptive parameters for PA variables and for the overall PA of female students.

	Me	RQ	DG-quartile	Skew	Kurt	Max D	K-S p
PA-walking	26,67	39,63	12,10 – 51,73	1,56	3,19	0,14	p < ,01*
PA -moderate int.	21,83	36,21	9,54 -45,75	2,06	4,30	0,19	p < ,01*
PA -high int.	0,00	16,00	0,00 – 16,00	3,04	10,07	0,31	p < ,01*
PA overall	64,75	79,17	36,00 -115,18	1,73	3,51	0,17	p < ,01*

Legend: PA- physical activity, Me - median, RQ- interquartile, DG-quartile - lower and upper quartile, Skew- skewness of distribution, Kurt- kurtosis of distribution, Max D - maximum deviation between cumulative empirical relative frequency and cumulative theoretical relative frequency, K-S p- the level of significance of Kolmogorov-Smirnov test, * denotes statistically significant deviation at the level of 0,01

The results are very similar to the results of the study obtained for the general population of adult females in the Republic of Croatia (Jurakić, 2009)). The above mentioned results are consistent with the current knowledge about the level of physical activity of students which is not significantly higher than the level of physical activity in general population. (US DHHS, 2000). Female students from the University of Zadar reach higher overall level of physical activity than their female peers from the University of Zagreb (Pedišić, Rakovac, Titze, Jurakić, and Oja., 2014). One possible explanation for this higher result can be found in different geographic locations which accordingly have different climate conditions. Zagreb belongs to a geographic area of moderate continental climate which is characteristic for somewhat lower temperature values and more changeable weather when compared to Zadar which is located in Mediterranean climate with higher average monthly temperatures (DHMZ, 2014). The data on regional differences in the percentage of insufficiently active females were obtained from Croatian health survey in 2003 which showed that Zagreb city area came first in this category (insufficiently active), men and women alike, and it is therefore possible to assume, based on these findings, that the students from Zagreb city area will achieve lower results in comparison with general student population.

In comparison with the results obtained in the study by Tasmektepligil, Agaoglu, Atan and Cicek from 2013, female students from the University of Zadar reach lower level of PA when compared to students from the Faculty of Kinesiology. Female students of the Faculty of Kinesiology represent a specific subgroup which is predisposed to reach higher levels of physical activity considering the curriculum framework of their study and their future profession. In addition, female students from the University of Zadar have higher overall level of physical activity in comparison with female students from the University of Zagreb, Faculty of Humanities and Social Sciences (Mudronja, Petračić and Pedišić, 2011).

The median value for walking activity of female students is 26.67 MET- hours/week, which is approximately equivalent to 1.15 hours of walking per day, while the median for activities of moderate intensity is 21.83 MET- hours/week, which is approximately equivalent to 1.09 hours of physical activity of moderate intensity five days a week. The median value for physical activity of high intensity is 0, which means that female students from the University of Zadar do not engage in physical activities of high intensity. The results are somewhat better in comparison with the results obtained from the study by Tasmektepligila and

Associates (2013), according to which female students reach 13.2 MET- hours/week in walking activities, while their activities of moderate and high intensity amount to 0 MET- hours/week. Their results are worse in comparison with female students from the Faculty of Kinesiology who reach 23.1 MET- hours/week as was recorded for walking activities, 8 MET- hours/week in physical activities of moderate intensity and 32 MET- hours/week in physical activities of high intensity. The median for walking activities among Zadar female students is more than twice higher than recommended „dose“ of walking (11.25 MET/hours per week) which has been known to reduce the risk in all-cause mortality by 11 per cent (Kelly et al., 2014). Therefore, it can be concluded that female students from the University of Zadar can expect to achieve positive effects from walking and reduce their risk of developing serious health problems. The results obtained pertaining to various domains of physical activity and their percentage in relation to their

characteristics confirm the findings of the existent research according to which men tend to participate more in activities of moderate and high intensity while women tend to spend more time in walking activities (Leslie, Fotheringham, Owen and Bauman, 2001). Furthermore, HagstrSomer, Bergman, Bauman and Sjostrom (2006) have obtained results according to which 35-45% of the overall quantity of health oriented physical activity pertains to walking activities in which women and elderly people participate more. Pinto and Marcus (1995) state that women participate more in aerobic activities and in walking activities in comparison with men who spend more time in weight training. The Table 2 shows the descriptive parameters for the Self-esteem evaluation scale. The results of Kolmogorov-Smirnov test indicate that the distribution departs significantly from the normal distribution at the level of significance $p < 0.05$. The results are to a mild degree negatively asymmetric, which is to be expected.

Table 2. Descriptive parameters for overall self-esteem among female students.

	Mean	Min	Max	SD	Skew	kurt	Max D	K-S p
Overall self-esteem	32,44	16	40	4,47	-0,48	0,01	0,08	p < ,05*

Legend: Mean- arithmetic median, Min- minimum result, Max- maximum result, SD - standard deviation, Skew - skewness (of a distribution), Kurt- kurtosis (of a distribution), Max D - maximum deviation between cumulative empirical relative frequency and cumulative theoretical relative frequency, K-S p - the level of significance of Kolmogorov-Smirnov test; * denotes statistically significant deviation

The average result obtained for the overall self-esteem is 32.44 indicating that female students of the University of Zadar have high self-esteem. Similar results were obtained from the study on students from the University of Zagreb (Mean=31.6)(Mirjanić and Milas, 2009) and from the study on female students (Mean=30,27)(Pokrajac- Bulian, Ambrosi-Randić and Kukić, 2008). Slightly lower value, which nevertheless points to a high level of the overall self-esteem, was obtained from the study conducted by Pokrajac-Bulian and Živčić-Bećirević(2005) (Mean=29.88).

High level of self-esteem was found in the study on Afro-American female students (Mean=21.67) (Danso, 2013) and among young adult female Canadians whose average age was 21.9 years (Mean=21.12) (Magnus, Kowalski and McHugh 2010), with the range of values from 0-30 in both studies. Of the total number of female students who participated in the study (Table 3) a great majority of them 96,15% has above the average (74.68%) or average (21.47%) self-esteem.

A smaller amount of female students has low below the average level of self-esteem (3.85%).

Table 3. The results of the overall self-esteem assessment.

SELF-ESTEEM	N	Percentage (%)
Below the average-low (10-24)	12	3.85
Average (25-29)	67	21.47
Above the average-high (30-40)	233	74.68

Legend: N-number of female students

The results were better when compared to the study conducted on US female students (Dembeck, 2011) which recorded 91.2% of female students with average and high self-esteem and 8.8% of female students of low level of self-esteem.

Similar as among Zadar female students, the above the average results on self-esteem were obtained from the study by Slunjski (2006) which was conducted on a total of 229 students from the

Faculty of Economy and the Faculty of Humanities and Social Sciences in Zagreb.

The Table 4 shows Spearman correlation coefficients in the relation between the overall level and type of physical activity and self-esteem of female students. The results indicate that there is significant ($p < 0.05$) and positive correlation between physical activity of moderate intensity and self-esteem ($r = 0.14$).

Table 4. Correlation between PA and self-esteem.

	PA walking	PA moderate intensity	PA high intensity	OVERALL PA
Overall self-esteem	-0.05	0.14*	-0.02	0.08

Legend: PA- physical activity, *- denotes statistically significant correlation at the level of significance $p < 0.05$

Similar as in this study, significant positive correlation between the overall physical activity and self-esteem, as well as between moderate physical activity and self-esteem of students, were obtained in the study by Yahong, Zhipengi Shunzhong (2014). Furthermore, Spence, McGannon and Poon (2005) state that approximately 60% of research papers included in their study indicate a positive correlation between physical activity and self-esteem. However, McAuley et al. (2000) challenge the actual amount of change towards more positive self-esteem that can be expected as a result of engaging in physical activity. In addition to this, it has been verified that also the type of physical activity has a different indirect impact on building self-esteem: team sports are linked with higher self-esteem to a greater extent in comparison with individual sports (Slutzky and Simpkins, 2009). In addition, it has been established that walking activities have less impact on building self-esteem in comparison with physical activity aimed at improving muscle strength, flexibility and balance (Gothe et al., 2011).

There are four possible moderators of effects of physical activity on overall self-esteem (Spence et al. 2005). Firstly, the changes in physical condition can have effect on the change in self-efficacy, which in its turn will further influence overall self-esteem. Secondly, where physical condition is a moderator of the correlation between physical activity and self-esteem the initial condition must be taken into consideration. Persons with low levels of physical fitness are expected to achieve greater changes in self-esteem as a result of increased physical activity. Thirdly, the initial level of self-esteem is a moderator in the correlation between physical activity and self-esteem. Persons with lower levels of self-esteem are expected to achieve greater changes in self-esteem as a result of increased physical activity. And finally, different variables of physical activity as frequency, duration,

intensity and type correlate with changes in self-esteem. Thus, physical activity of higher frequency, duration and intensity should result in greater changes of self-esteem. This has also been proven by the study conducted by Lindwall and Hassmen (2004) where the authors affirm that the frequency and duration of exercise can contribute to explain the perception of physical fitness and sports competence as subdomains of self-esteem and they conclude that more frequent exercise during longer periods of time correlates with higher results on the scales of the above mentioned subdomains of self-esteem. Promoting physical activity among female students can lead to higher level of self-esteem and satisfaction with life and it can reduce the risk for anxiety and depression (Hawker 2012).

The results of this study conducted on Zadar female students also verify the research conducted so far in Croatia where the findings show that there is a positive correlation between physical activity and self-esteem among adolescents (Magdalena Kustor-Štetić, 2018) and that more physically active girls demonstrate higher self-esteem (Ambrosi-Randić, 2004).

Conclusion

The study confirmed that there exists both statistically relevant and positive correlation between moderate level of physical activity and the overall degree of self-esteem among female students of the University of Zadar. Considering the above, the interventions aimed at increasing the overall self-esteem of female students should be focused on introducing physical activities of moderate intensity which involve energy expenditure in the range between three or six metabolic units. Such activities are: speed walking, dancing, gardening, household chores, walking pets, carrying/lifting moderate weights (<20 kg) etc.

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Received: March 14, 2019

Accepted: June 10, 2019

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