

## Assessment of life satisfaction and its selected components in relation to the level of physical activity

MARTINA LOJDOVÁ<sup>1</sup>, JANA KVINTOVÁ<sup>2</sup>, DANA ŠTĚRBOVÁ<sup>3</sup>, PETR KROL<sup>4</sup>

<sup>1,3,4</sup>Department of Social Sciences, Faculty of Physical Culture, Palacký University in Olomouc, CZECH REPUBLIC

<sup>2</sup>Department of Psychology and Abnormal Psychology, Faculty of Education, Palacký University in Olomouc, CZECH REPUBLIC

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### Abstract:

The issue of life satisfaction (LS) spans many areas and spheres of life; at the same time, it is also determined by many factors. Health, specifically physical health, is the result of physical activity (PA); at the same time, it can also be the cause of mental health, which is closely related to LS. This study focused on university students and their LS and PA and monitored the behaviour of both variables depending on their degree. The participants of the survey were enrolled as full-time students at Palacký University in Olomouc in the Czech Republic; the total number of participants was 511 with the average age of 22.5 years. The standardized LS Questionnaire and the standardized International PA Questionnaire were used to assess LS and level of PA. The higher degree of one's general LS positively correlated with the higher level of PA. Among the students with high level of PA, the general LS was significantly higher than among students without PA ( $p = .004$ ;  $d = 0.57$ ) or with a low level ( $p = .003$ ;  $d = 0.4$ ) of PA. Similar results between high and low PA were also obtained in the areas of leisure satisfaction ( $p = .015$ ;  $d = 0.41$ ), in satisfaction of sexuality between high and no PA ( $p = .013$ ;  $d = 0.5$ ). The obtained results showed that university students with high level of PA assessed their LS significantly better compared to university students with low level of PA (correlation between PA and the subjectively perceived degree of general LS or some of its components such as leisure and sexuality).

**Key Words:** well-being, health, active style, university students

### Introduction

The general perspective of the term *satisfaction* expresses a certain degree of personal coping, personal happiness, and often a degree of personal activity and inclusion in the society. In general, *satisfaction* is a result of meeting one's specific needs. In this study, *life satisfaction* (LS) is a multidimensional construct that is closely related to the area of personal well-being and quality of life (Regan et al., 2016; Santini et al., 2020). LS is based on the global cognitive assessment of one's own life, or it may be considered in the context of individual domains such as health or lifestyle (Diener & Diener, 2009). Finally, the degree of LS may determine the successes and failures linked to the developmental tasks of an individual (Karaš, Ciecuch, Negru, & Crocetti, 2015).

In connection with LS, this study is focused on university students. University students are a specific population group that is on a certain border of two developmental stages (adolescence and young adulthood) (Thorová, 2015). Arnett (2000) has studied the trends and changes among young adults and coined the term *emerging adulthood*, which marks this period. Every personality strives to develop towards a higher level of mental maturity, which is also possible to say about an individual during his/her university studies (Hopwood et al., 2011). Along with the fulfilment of developmental tasks, which stimulate stress, an individual is also burdened by high demands in the performance of duties during university studies (Tam & Lim, 2009) [i.e., academic stress], which can affect personal well-being (Watson & Watson, 2016) and LS with its individual components (Sigmund, Kvintová, Hřebíčková, Šafář, & Sigmundová, 2014). Thus, the topic of health and LS is increasingly discussed among students; moreover, in the future, these students should be a national capital and investment (Abilleira-González et al., 2019; Franco et al., 2019).

A warning signal may be that individuals exhibit a low degree of general LS than their non-studying peers (Kvintová, Sigmund, & Hřebíčková, 2014). In general, the health of this population is worse than that of non-studying population of the same age. Some studies have stated that the prevalence of psychological distress is higher among university student than that among working non-studying individuals of the same age (Dyrbye et al., 2006; Kovess-Masfety et al., 2016; Večeřová-Procházková, 2004), while other studies have reported the same level of mental illnesses among both groups (McManus & Gunnell, 2020).

It is possible that there are many factors that may affect the degree of LS. The satisfaction in individual life areas and LS are affected by both common and specific factors (Aldridge et al., 2016; Cikrikci & Odaci, 2016;

Hnilica, 2006). At the same time, the higher level of LS for students is a predictor of good health, high study motivation, work productivity, acceptable interpersonal relationships, and healthy lifestyle (Karaman & Watson, 2017; Rodný & Rodná, 2001).

Previous studies (Rezaei & Khosroshahi, 2018; Rodný & Rodná, 2001; Temiz & Comert, 2018; Zuffianò et al., 2018) have stated that the subjective assessment of health as well as satisfaction with self, leisure, and one's sexuality are important determinants of psychosocial health. At the same time, the abovementioned factors affect the level of LS of young adults, which includes university students. Therefore, based on previous studies, in this study we are interested in the general satisfaction of an individual as well as in his/her satisfaction with health, sexuality, self, and leisure. These components are chosen based on the standardized method of the LS Questionnaire, which states that there may be some correlation between general life satisfaction and individual components of satisfaction (Rodný & Rodná, 2001).

In addition to the complete list of topics discussed in this study, it is necessary to mention physical activity (PA), because it is generally accepted that PA is an important factor that affects one's health, happiness, and LS (Pengpid & Peltzer, 2019). Regarding the target group of university students, there are various opinions. Some studies have stated that university students face a certain risk of lowering the level of their PA during their transfer from secondary school to university (Kwan, Cairney, Faulkner, & Pullenayegum, 2012). Other studies have suggested that the level of PA is higher than it was in the past, mainly during the first year studies (Crozier et al., 2015). According to the study by Siahpush et al. (2019), there is a certain interconnection between PA and higher level of education (university education). In addition, an inverse relation between PA frequency and perceived effect of stress was discovered; furthermore, it was determined that several hours of PA positively affected studying (Meyer & Larson, 2018). In all cases, PA, especially regular PA, is associated with an individual's LS through lifestyle, as has been reported by Maher, Pincus, Ram, & Conroy (2015) or Pengpid & Peltzer (2019).

The line of thought of this study leads to a specific research question, which was a smooth continuation of the abovementioned studies in the introductory part. Therefore, the main objective is to compare LS and PA and to evaluate their relationship. The added value is the uniqueness of the research sample, which is characterized by people during the period of younger adulthood, who are engaged in full-time tertiary education at a university. The results of this research contribute to the specification of this narrow segment where university students are located. The transfer to the area of working with university students (mainly to the area of educational psychological counselling) is also important.

## Materials and methods

### Participants

This study included a total of 511 university students (79 men, 432 women). The average age was 22.5 years old (Table 1). The university students participating in our study were undergraduate students from Palacký University in Olomouc (Czech Republic).

**Table 1:** Characteristics of university students ( $N = 511$ )

	Number of participants (men/women)
Students without PA	55 (9/46)
Students with low PA	104 (7/97)
Students with moderate PA	175 (24/151)
Students with high PA	177 (39/138)
Total	511 (79/432)

Note: PA = physical activity

### Measuring instruments

The standardized Life Satisfaction (LS) Questionnaire developed by Rodný & Rodná (2001) is the Czech version of the German Fragebogen zur Lebenszufriedenheit developed by Fahrenberg, Myrtek, Schumacher, & Brähler (2001). This tool was used to determine the LS of respondents. This questionnaire evaluates satisfaction in individual areas (satisfaction with health, sexuality, self, and leisure) and general satisfaction. Each area consists of seven items (statements); the respondent mark one number on a scale from 1 to 7 for each item (1 = very dissatisfied, 7 = very satisfied) (Rodný & Rodná, 2001), which correspond to his/her current level of satisfaction with that item. To properly categorize physical activity, we used the International Physical Activity (PA) Questionnaire - IPAQ. Physically inactive participants were those who reported increased values of sedentary behaviour during a week (7 days) and whose energy expenditure during PA was lower than 600 MET-minutes/week (IPAQ Manual, 2005).

The Ethics Committee of the Faculty of Physical Culture (EK FTK UP) supported the implementation of the submitted research no. 48/2014. Before the actual implementation of data collection, the participants were acquainted in detail with the concept and purpose of research, agreed to use the data for scientific purposes, and signed informed consent. All data were anonymous, voluntary, and the individual could terminate his/her participation at any time.

*Statistical analysis*

Two measuring instruments were mainly used: the Shapiro-Wilk test and the Kruskal-Wallis test. The first, the normality test, checked whether the data was in an unusual or skewed arrangement. Since this assumption was fulfilled, the second test compared the mean values of all categories. The level of statistical significance was tested at  $p \leq 0.05$ . Statistical significance expressed by  $p$  values was supplemented by  $d$  values (Cohen's coefficient).

$$d = \frac{M_1 - M_2}{SD_{pooled}}, \text{ where } SD_{pooled} = \frac{\sqrt{[(n_1 - 1)SD_1^2 + (n_2 - 1)SD_2^2]}}{[n_1 + n_2 - 2]}$$

The effect size  $d$  was expressed as: 0.8 large, 0.5 moderate, and 0.2 small effect (Thomas, Nelson, & Silverman, 2011). The calculation of basic statistical quantities for each variable preceded the abovementioned procedures. The Statistica program was used to obtain all the resulting values.

**Results**

The obtained results allow to evaluate university students from two angles, which compare them. On the one hand, there is an amount of physical activity (PA) expressed by level: no, low, medium, high (IPAQ Manual, 2005). On the other hand, LF is evaluated in general or based on its individual domains, i.e., so-called components: health, leisure, self, and sexuality (Fahrenberg et al., 2001).

In general, Table 2 shows that in our selected target group, the always higher reported amount of PA symbolized a higher level of general life satisfaction (LS). The most significant differences were noted between high and no PA levels ( $p = .004$ ;  $d = 0.57$ ) and between high PA and low ( $p = .003$ ;  $d = 0.4$ ).

The same rule was applied to specific individual domains of LS; it was determined that with an increase in PA, satisfaction with health and leisure increased. However, the subjectively assessed satisfaction with one's health among individuals with high PA did not match any statistically significant numbers compared to the individuals with different levels of this activity, which is similar to the satisfaction with self. In terms of leisure satisfaction, students with high PA showed statistically significant values comparing to students with low PA ( $p = .015$ ;  $d = 0.41$ ). Regarding one's sexuality satisfaction, individuals with high PA exhibited significantly higher values compared to students without PA ( $p = .013$ ;  $d = 0.5$ ). See Table 2.

**Table 2:** Measured data of LS of university students in connection with the amount of reported PA

		Mean ± SD	H	Comp.	P	d
<b>GLS</b>	no PA	233.84 ± 37.64	18.45	0-L	NS	0.15
	low PA	239.25 ± 33.78	p=.0004	0-M	NS	0.37
	moderate PA	245.67 ± 30.04		0-H	.004	0.57
	high PA	251.41 ± 28.67		L-M	NS	0.20
				L-H	.003	0.40
M-H				NS	0.20	
<b>Health</b>	no PA	32.42 ± 7.54	10.58	0-L	NS	0.06
	low PA	32.85 ± 7.42	p=.0142	0-M	NS	0.13
	moderate PA	33.34 ± 6.84		0-H	NS	0.36
	high PA	34.88 ± 6.69		L-M	NS	0.07
				L-H	NS	0.29
M-H				NS	0.23	
<b>Leisure</b>	no PA	32.58 ± 10.8	11.54	0-L	NS	0.03
	low PA	32.87 ± 8.17	p=.009	0-M	NS	0.33
	moderate PA	35.29 ± 7.41		0-H	NS	0.41
	high PA	35.90 ± 7.02		L-M	NS	0.32
				L-H	.015	0.41
M-H				NS	0.09	
<b>Self</b>	no PA	33.31 ± 8.2	7.90	0-L	NS	0.10
	low PA	34.03 ± 6.55	p = .048	0-M	NS	0.20
	moderate PA	34.66 ± 6.22		0-H	NS	0.37
	high PA	35.74 ± 6.10		L-M	NS	0.10
				L-H	NS	0.27
M-H				NS	0.18	
<b>Sexuality</b>	no PA	33.20 ± 8.22	9.50	0-L	NS	0.34
	low PA	35.79 ± 7.42	p=.023	0-M	NS	0.31
	moderate PA	35.62 ± 7.69		0-H	.013	0.50
	high PA	36.90 ± 7.20		L-M	NS	0.02
				L-H	NS	0.15
M-H				NS	0.17	

Note: Comp. = comparison; PA = PA; NS = not significant; GLS = general life satisfaction; L = low PA; M = moderate PA; H = high PA

## Discussion

Individual's life satisfaction (LS) originates from the cognitive assessment by an individual just as individual's life opinion (Diener & Diener, 2009). LS contributes to the mental health and may be a basis for the state of feeling happy (Antaramian, 2017; Guzmán et al., 2019; Lombardo et al., 2018). This study aims to identify the issue concerning the target group of university students; in addition, it analyses conditions in the context of physical activity (PA) and LS.

According to general parameters, it can be stated that university student is a single and childless individual who is 22–24 years old. During the university study period, changes in personality occur as well as other important changes in social life (Maher et al., 2015). Many negative phenomena occur during the studies (e.g., undesirable stress) (Acharya et al., 2018; Khan et al., 2016; Sharp & Theiler, 2018), which may ultimately affect the LS of an individual. Based on similar studies, it is possible to conclude that there are various levels of PA among university students. In addition, weight gain is often registered during individuals' transfer from secondary school to university (Miller & Hartman, 2020); apart from the rarely stated increased PA (Crozier et al., 2015), mainly the risk of decreased PA (Bray & Born, 2004) is present; this negatively affects the quality of life, which closely corresponds to LS, as has been already mentioned (Pašková et al., 2019, Sigmund et al., 2014). Though these individuals have the risk of decreased PA, Sigmundová et al. (2013) have mentioned that members of this population group are still more physically active than non-studying members of the population of people of the same age. The authors of this study are interested to determine how the level of PA in university students affects the level of LS or its individual components and the relationship between these terms.

The research sample in our study consisted of university students who belonged to various levels of PA (no, low, moderate, and high). The study compared students with high PA to students without PA or low PA. Based on the obtained results, a direct proportional tendency between LS and level of PA was observed. The expectation that students with high PA would have a higher degree of LS (or some of its components) was confirmed. This statement is congruent with Kebza & Šolcová (2003), who stated that because PA affects general LS, it also has an unconditional effect on its individual components.

From the general point of view, general LS shows that an individual is satisfied with many areas of life. Dissatisfaction with certain aspects is compensated by satisfaction in other areas, as directly stated in the test manual (Rodný & Rodná, 2001). The general satisfaction with life is mostly reflected in the area of satisfaction with health or self; the tested people mostly had better state of health, as Rodný & Rodná (2001) have mentioned; therefore, it is possible to look for connections. PA affects LS through self-efficiency or physical self-esteem (Pašková et al., 2019). Statistically significant differences in general LS were also recorded in the research presented by us, i.e., between groups without PA and high PA and in the groups with low PA and high PA. A certain connection is also acknowledged by authors, who confirmed that sport in general and the optimal level of PA can contribute to quality of life and were associated with LS (Gellert et al., 2019; Snedden et al., 2019; Wiese et al., 2018). It is also necessary to state the opinion of Maher et al. (2015), who determined that the level of PA was not necessarily related to LS. A special analysis of such studies is recommended to address the relationship between these variables. However, it is not yet clear how a particular level of PA can affect an individual's mental state and the resulting LS (Joseph, Royse, Benitez, & Pekmezi, 2014). PA can affect an individual's general satisfaction; however, it has not been confirmed that two variables are correlated with each other.

Health satisfaction is the next essential component of LS. Individuals with high health satisfaction were subjectively satisfied with their current state of health as well as with their physical and mental condition; therefore, this type of satisfaction is correlated with satisfaction with self or sexuality (Rodný & Rodná, 2001). The developmental period of a university student is considered to be transient because the person is newly entering the stage of young adulthood. This transition is a critical period of life, especially in terms of association with health, which may result in, for example, reduced PA and other issues (Kwan et al., 2012). In addition, it is clear that higher degree of PA is an important prerequisite for personal well-being and health (Kebza & Šolcová, 2003; Rhodes et al., 2017). The data obtained in this study show that the measured values of LS with health increased proportionally to increasing values of PA. However, no statistically significant differences were observed between different groups of PA. Thus, it is assumed that PA has a certain effect on the physical health of an individual (Rhodes et al., 2017); however, it does not affect the subjectively presented satisfaction with health (Rodný & Rodná, 2001), which are two different concepts. However, of note, the determining influence was not rejected.

Another part of LS is satisfaction with leisure. This satisfaction is based not only on the length of leisure time but also on its quality or diversity (Rodný & Rodná, 2001). Previous studies have indicated that leisure time tends to increase with age (Cho et al., 2018; Kim et al., 2018). Individuals at a university assume all responsibility for their leisure activities; many individuals experience incorrect time organization, incorrect time planning, time wasting, and procrastinate, which may negatively affect individual's psyche (Demirel, Demirel, & Serdar, 2017) and passive leisure time. In contrast, individuals with active leisure time that includes PA, show higher personal well-being than the same individuals who spend time on television or computer (Holder, Coleman, & Sehn, 2009). The results of this study show that in addition to higher PA values there are also higher values of satisfaction with leisure. However, statistically significant values were recorded only between two

groups (low and high PA). Thus, PA can affect satisfaction with leisure, but it is not necessarily a determining factor for this satisfaction. Cho et al. (2018) have stated that it is not important whether an individual chooses active or passive leisure activities; however, the frequency of participation in these activities and how satisfied the person is with the possibility of spending this time are important.

Satisfaction with self is most reflected in the general LS of an individual (Rodný & Rodná, 2001) and can be affected by both social position and prestige of an individual as well as by the feeling of life successfulness (Deaux & Snyder, 2012). Among the students with high PA, the awareness of one's Self is significantly conditioned by physical Self, i.e., the individual adopts a concrete stance on their body, which may be affected by the satisfaction with their image (body image). Currently, body image and its disorders are frequently discussed worldwide (Glashouwer et al., 2019); the term indicates what an individual thinks about his/her body, how it is perceived and felt (Piran, 2019). Our results show that for higher PA there was also a higher level of satisfaction with self. However, the differences between PA levels were not statistically significant. Thus, PA can positively determine the degree of satisfaction in this area but it still cannot ensure that an individual is satisfied with himself/herself owing to important determinants such as individual's self-confidence and self-love. These determinants distort one's own judgment of subjective evaluation, as has been reported by Myers & Twenge (2018).

During the period of young adulthood (in which it is possible to include university students), one's satisfaction in the area of sexuality is one of important components of the general LS (Schmiedeberg et al., 2017; Straub, 2019). University studies are, for most individuals, a period in which the area of sexuality becomes prominent (Sigmund et al., 2014). Crooks et al. (2010) have shown that these individuals report the largest number of sexual partners during this period. Satisfaction with sexuality is an indicator of a healthy sexual life during this period; this sexual life will later allow individuals to move from friendly sexual relations to more advanced ones, which will then fully contribute to health in all dimensions (i.e., mental, physical, spiritual, and social) (Pomerantz, 2020). It is confirmed that satisfaction with sexuality reaches higher values in men and in people living with a partner. Satisfaction with sexuality usually occurs in tandem with satisfaction with self and satisfaction with health (Rodný & Rodná, 2001).

The study by Sigmund et al. (2014) suggests that sexual behaviour is a direct psychosocial determinant of health. In addition, PA affects health, especially physical health, owing to the preventive reduction of the incidence of chronic diseases (Rhodes et al., 2017). Therefore, it can be assumed that PA positively affects health and sexual satisfaction, and vice versa. The results of our study confirm that for higher PA values satisfaction increases in these individuals. However, significant values were recorded only between groups with individuals without and with high PA. Thus, it is assumed that PA contributes to the physical attractiveness or sexual performance of an individual, which is positively reflected in satisfaction with sexuality. Therefore, the absence of PA presupposes health problems, as stated in the handbook for the LS Questionnaire (Rodný & Rodná, 2001). Compared to our results, it can be stated that PA in university students is one of the variables that contributes to increasing the level of LS not only in the sexual area (Pašková et al., 2019). However, our data did not clearly confirm the connection between these variables; the data only indicated a possible determinant.

A similar determining effect has been reported by other studies for other components of life satisfaction (statistically significant differences were recorded only in some cases). The results of this study contributed new and current data to the issue of university students, specifically to the topic of LS and PA.

Though the total number of research participants is extensive, the authors are aware of limitation of this study such as gender disbalance of participants, i.e., the considerably larger number of female participants. However, Checa et al. (2019) suggests that women and people in relationships may exhibit higher subjective well-being. Another equally important limitation is the cohort effect. The authors of this study took these facts into account. This study seeks to contribute professional data and expand knowledge on the issues of selected target group of university students, teaching, or their counselling. The question of gender with regard to LS and PA as well as other hypotheses of the causal type can topics of future studies.

## Conclusions

In general, the obtained data show that life satisfaction (LS) among university students increases in proportion to the reported level of PA, and vice versa. Decreasing PA is a predictor of decreasing satisfaction. However, there were only isolated statistically significant differences between the levels of PA in the area of satisfaction with leisure and sexuality and in general LS. Thus, although these are no statistically significant results, it can be stated that PA positively affects individual satisfaction, although only to a minimal extent. The obtained data can advance the field of tertiary counselling in addition to career and study counselling, mainly in the area of personal support in solving problems. The inclusion of PA is an idea that needs to be prioritized when creating study programs. Last but not least, the mere establishment of cooperation with sports facilities in the area or the offered opportunity to participate in supporting projects that may be voluntarily available to individuals during their studies seems to be the least demanding solution. Of course, the obtained results open up topics for further investigation and encourage an even deeper focus on the studied issue.

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**References**

- Abilleira-González, M., Fernández-Villarino, M. A., Varela-Casal, C., Arufe-Giráldez, V., Silva-Piñeiro, R., & Gonzalez-Gonzalez, S. G. (2019). PA intervention program through walking routes in sedentary university students. *Journal of Human Sport and Exercise, 14*(2), 411-425.
- Acharya, L., Jin, L., & Collins, W. (2018). College life is stressful today—Emerging stressors and depressive symptoms in college students. *Journal of American College Health, 66*(7), 655-664.
- Aldridge, J. M., Fraser, B. J., Fozdar, F., Ala'i, K., Earnest, J., & Afari, E. (2016). Students' perceptions of school climate as determinants of wellbeing, resilience and identity. *Improving Schools, 19*(1), 5-26.
- Antaramian, S. (2017). The importance of very high life satisfaction for students' academic success. *Cogent Education, 4*(1), 1-10.
- Arnett, J. J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. *American Psychologist, 55*(5), 469.
- Bray, S. R., & Born, H. A. (2004). Transition to university and vigorous physical activity: Implications for health and psychological well-being. *Journal of American College Health, 52*(4), 181-188.
- Cikrikci, Ö., & Odaci, H. (2016). The determinants of life satisfaction among adolescents: The role of metacognitive awareness and self-efficacy. *Social Indicators Research, 125*(3), 977-990.
- Crooks, R., Baur, K., & Rojas, L.C. (2010). *Nuestra sexualidad*. Mexico: Cengage Learning.
- Crozier, A. J., Gierc, M. S., Locke, S. R., Brawley, L. R. (2015). Physical activity in the transition to university: The role of past behavior and concurrent self-regulatory efficacy. *Journal of American College Health, 63*(6), 380-387.
- Czosnek, L., Lederman, O., Cormie, P., Zopf, E., Stubbs, B., & Rosenbaum, S. (2019). Health benefits, safety and cost of PA interventions for mental health conditions: A meta-review to inform translation efforts. *Mental Health and PA, 16*, 140-151.
- Deaux, K., & Snyder, M. (Eds.). (2012). *The Oxford handbook of personality and social psychology*. Oxford University Press.
- Demirel, D. H., Demirel, M., & Serdar, E. (2017). University students' opinions of the meaning of leisure and their perceived freedom in leisure. *Journal of Human Sciences, 14*(1), 796-802.
- Diener, E., & Diener, M. (2009). Cross-cultural correlates of life satisfaction and self-esteem. In *Culture and well-being*, 71-91. Springer, Dordrecht.
- Dyrbye, L. N., Thomas, M. R., Huntington, J. L., Lawson, K. L., Novotny, P. J., Sloan, J. A., & Shanafelt, T. D. (2006). Personal life events and medical student burnout: a multicenter study. *Academic Medicine, 81*(4), 374-384.
- Fahrenberg, J., Myrtek, M., Schumacher, J., & Brähler, E. (2001). *Dotazník životní spokojenosti* [Life Satisfaction Questionnaire]. Prague, Czech Republic: Testcentrum.
- Franco, D. C., Ferraz, N. L., & de Sousa, T. F. (2019). Sedentary behavior among university students: a systematic review. *Brazilian Journal of Kineanthropometry & Human Performance, 21*, 1-15.
- Gellert, P., Wienert, J., Ziegelmann, J. P., & Kuhlmeiy, A. (2019). Profiles of physical activity biographies in relation to life and aging satisfaction in older adults: longitudinal findings. *European Review of Aging and Physical Activity, 16*(14).
- Glashouwer, K. A., van der Veer, R. M., Adipatria, F., de Jong, P. J., & Vocks, S. (2019). The role of body image disturbance in the onset, maintenance, and relapse of anorexia nervosa: A systematic review. *Clinical Psychology Review, 74*, 101771.
- Guzmán, J., Green, J. G., Oblath, R., & Holt, M. K. (2019). Life satisfaction mediates the association between mental health risk and perceptions of school functioning among children and adolescents. *Contemporary School Psychology, 24*, 389-399.
- Hnilica, K. (2006). Diagnóza a věk moderují vztah mezi zdravím, emočním životem a spokojeností se životem [Diagnosis and age moderate the relationship between health, emotional life and life satisfaction]. *Československá psychologie, 50*(6), 489-506. [Czechoslovak Psychology: Journal of Psychological Theory and Practice]. Prague, Czech Republic: Academia.
- Holder, M. D., Coleman, B., & Sehn, Z. L. (2009). The contribution of active and passive leisure to children's well-being. *Journal of Health Psychology, 14*(3), 378-386.
- Hopwood, C. J., Donnellan, M. B., Blonigen, D. M., Krueger, R. F., McGue, M., Iacono, W. G., & Burt, S. A. (2011). Genetic and environmental influences on personality trait stability and growth during the transition to adulthood: a three-wave longitudinal study. *Journal of Personality and Social Psychology, 100*(3), 545.
- Checa, I., Perales, J., & Espejo, B. (2019). Measurement invariance of the Satisfaction with Life Scale by gender, age, marital status and educational level. *Quality of Life Research, 28*, 963-968.

- Cho, D., Post, J., & Kim, S. K. (2018). Comparison of passive and active leisure activities and life satisfaction with aging. *Geriatrics & gerontology international*, 18(3), 380-386.
- IPAQ Manual. (2005). *Guidelines for data processing and analysis of the International PA Questionnaire (IPAQ) – short and long forms*. Retrieved 18. 3. 2021 from the World Wide Web: <http://www.ipaq.ki.se>
- Joseph, R. P., Royse, K. E., Benitez, T. J., & Pekmezi, D. W. (2014). Physical activity and quality of life among university students: exploring self-efficacy, self-esteem, and affect as potential mediators. *Quality of Life Research*, 23(2), 659-667.
- Karaman, M. A., & Watson, J. C. (2017). Examining associations among achievement motivation, locus of control, academic stress, and life satisfaction: A comparison of US and international undergraduate students. *Personality and Individual Differences*, 111, 106-110.
- Karaš, D., Ciecuch, J., Negru, O., & Crocetti, E. (2015). Relationships between identity and well-being in Italian, Polish, and Romanian emerging adults. *Social Indicators Research*, 121(3), 727-743.
- Kebza, V., & Šolcová, I. (2003). Well-being jako psychologický a zároveň mezioborově založený pojem [Well-being as a psychological and interdisciplinary concept]. *Československá Psychologie: Časopis pro psychologickou teorii a praxi*, 47(4), 333-345. [Czechoslovak Psychology: Journal of Psychological Theory and Practice]. Prague, Czech Republic: Academia.
- Khan, M., Ahmed, F., Yasir, I., Aschar, A. A., Jahangir, M. H., Khan, A., Ali, F., & Tipu, H. H. A. (2016). Sources of Stress and Various Coping Strategies among MBBS Students of a Medical College. *Isra Medical Journal*, 8(2), 83-88.
- Kim, J., Kim, M., & Han, A. (2018). Exploring the relationship between types of leisure activities and life satisfaction, health perception, and social support among Korean individuals with physical disabilities. *American Journal of Health Behavior*, 42(4), 34-44.
- Kovess-Masfety, V., Leray, E., Denis, L., Husky, M., Pitrou, I., & Bodeau-Livinec, F. (2016). Mental health of college students and their non-college-attending peers: Results from a large french cross-sectional survey. *BMC psychology*, 4(1), 1-9.
- Kwan, M. Y., Cairney, J., Faulkner, G. E., & Pullenayegum, E. E. (2012). Physical activity and other health-risk behaviors during the transition into early adulthood: a longitudinal cohort study. *American Journal of Preventive Medicine*, 42(1), 14-20.
- Kvintová, J., Sigmund, M., & Hřebíčková, H. (2014). Life satisfaction and subjective health assessment in future teachers compared with current university students of physical culture and natural science. *An Independent Scientific Journal for Interdisciplinary Research in Pedagogy*, 2, 15-30.
- Lombardo, P., Jones, W., Wang, L., Shen, X., & Goldner, E. M. (2018). The fundamental association between mental health and life satisfaction: Results from successive waves of a Canadian national survey. *BMC Public Health*, 18(1), 1-9.
- Maher, J. P., Pincus, A. L., Ram, N., & Conroy, D. E. (2015). Daily physical activity and life satisfaction across adulthood. *Developmental Psychology*, 51(10), 1407-1419.
- McManus, S., & Gunnell, D. (2020). Trends in mental health, non-suicidal self-harm and suicide attempts in 16–24-year old students and non-students in England, 2000–2014. *Social Psychiatry and Psychiatric Epidemiology*, 55(1), 125-128.
- Meyer, S., & Larson, M. (2018). PA, Stress, and Academic Performance in College: Does Exposure To Stress Reduction Information Make a Difference. *College Student Journal*, 52(4), 452-457.
- Miller, K. G., & Hartman, J. M. (2020). Influence of PA on weight status during the first year of college. *Journal of American College Health*, 68(3), 258-262.
- Myers, D., G., Twenge, J., M. (2018). *Exploring Social Psychology* (8th ed.). McGraw-Hill.
- Pašková, L., Sližik, M., Blahutková, M., Górný, M. P., & Benedik, E. (2019). Sport activity in the context of subjective well-being of university students. *Trends in Sport Sciences*, 26(2), 85-90.
- Pengpid, S., & Peltzer, K. (2019). Sedentary behaviour, PA and life satisfaction, happiness and perceived health status in university students from 24 countries. *International Journal of Environmental Research and Public Health*, 16(12), 2084.
- Piran, N. (2019). *Handbook of Positive Body Image and Embodiment: Constructs, Protective Factors, and Interventions*. Oxford University Press.
- Pomerantz, A. M. (2020). *Clinical Psychology: Science, Practice, and Diversity* (5th ed.). SAGE Publications.
- Regan, M., Elliott, I., & Goldie I. (2016). *Better Mental Health for All: A Public Health Approach to Mental Health Improvement*. Mental Health Foundation.
- Rezaei, A., & Khosroshahi, J. B. (2018). Optimism, social intelligence and positive affect as predictors of university students' life satisfaction. *European Journal of Mental Health*, 13(2), 150-162.
- Rhodes, R. E., Janssen, I., Bredin, S. S., Warburton, D. E., & Bauman, A. (2017). PA: Health impact, prevalence, correlates and interventions. *Psychology & Health*, 32(8), 942-975.
- Rodný, T., & Rodná, K. (2001). *Dotazník životní spokojenosti* [Life Satisfaction Questionnaire]. Prague, Czech Republic: Testcentrum.

- Santini, Z. I., Stougaard, S., Koyanagi, A., Ersbøll, A. K., Nielsen, L., Hinrichsen, C., Madsen, K. R., Meilstrup, C., Stewart-Brown, S., & Koushede, V. (2020). Predictors of high and low mental well-being and common mental disorders: findings from a Danish population, based study. *European Journal of Public Health, 30*(3), 503-509.
- Schmiedeberg, C., Huyer-May, B., Castiglioni, L., & Johnson, M. D. (2017). The more or the better? How sex contributes to life satisfaction. *Archives of Sexual Behavior, 46*(2), 465-473.
- Sharp, J., & Theiler, S. (2018). A Review of Psychological Distress Among University Students: Pervasiveness, Implications and Potential Points of Intervention. *International Journal for the Advancement of Counselling, 40*, 193-212.
- Siahpush, M., Robbins, R. E., Ramos, A. K., Michaud, T. L., Clarke, M. A., & King, K. M. (2019). Does difference in physical activity between blacks and whites vary by sex, income, education, and region of residence? Results from 2008 to 2017, National Health Interview Surveys. *Journal of Racial and Ethnic Health Disparities, 6*, 883-891.
- Sigmund, M., Kvintová, J., Hřebíčková, H., Šafář, M., & Sigmundová, D. (2014). Life satisfaction, health, self-evaluation and sexuality in current university students of sport sciences, education and natural sciences. *Acta Gymnica, 44*(4), 231-241.
- Sigmundová, D., Chmelík, F., Sigmund, E., Feltlová, D., & Frömel, K. (2013). PA in the lifestyle of Czech university students: Meeting health recommendations. *European Journal of Sport Science, 13*(6), 744-750.
- Snedden, T. R., Scerpella, J., Kliethermes, S. A., Norman, R. S., Blyholder, L., Sanfilippo, J., McGuine, T. A., & Heiderscheid, B. (2019). Sport and PA Level Impacts Health-Related Quality of Life Among Collegiate Students. *American Journal of Health Promotion, 33*(5), 675-682.
- Straub, R. O. (2019). *Health Psychology: A Biopsychosocial Approach* (6th ed.). Worth Publishers.
- Tam, C. L., & Lim, S. G. (2009). Perceived social support, coping capability and gender differences among young adults. *Sunway Academic Journal, 6*, 75-88.
- Taran, S., Conti, J., Routhier, F., Latimer-Cheung, A. E., Noreau, L., & Sweet, S. N. (2018). Leisure time PA, perception of impact of pain and life satisfaction after spinal cord injury. *Annals of Physical and Rehabilitation Medicine, 61*(4), 273-275.
- Temiz, Z. T., & Comert, I. T. (2018). The relationship between life satisfaction, attachment styles, and psychological resilience in university students. *The Journal of Psychiatry and Neurological Sciences, 31*(3), 274-283.
- Thomas, J. R., Nelson, J. K., & Silverman, S. J. (2011). *Research methods in PA* (6th ed.). Human Kinetics.
- Thorová, K. (2015). *Vývojová psychologie. Proměny lidské psychiky od početí po smrt.* [Developmental Psychology. Changes in the human psyche from conception to death.]. Prague, Czech Republic: Portál.
- Večeřová-Procházková, A. (2004). Psychoneuroimmunologie. *Acta Psychiatrica Postgradualia Bohemica, 164*-175.
- Watson, J. C., & Watson, A. A. (2016). Coping Self-Efficacy and Academic Stress Among Hispanic First-Year College Students: The Moderating Role of Emotional Intelligence. *Journal of College Counseling, 19*(3), 218-230.
- Wiese, C. W., Kuykendall, L., & Tay, L. (2018). Get active? A meta-analysis of leisure-time physical activity and subjective well-being. *The Journal of Positive Psychology, 13*(1), 57-66.
- Zuffianò, A., Martí-Vilar, M., & López-Pérez, B. (2018). Prosociality and life satisfaction: A daily-diary investigation among Spanish university students. *Personality and Individual Differences, 123*, 17-20.