

A CROSS-SECTIONAL STUDY EXPLORING SPORT PARTICIPATION, PERCEIVED STRESS, AND ITS ASSOCIATION WITH LIFE SATISFACTION AMONG UNIVERSITY STUDENTS

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Abstract: Physical activity in type of sport participation is well-known for its enormous benefit for mental health, affecting in better mood and improved quality of life. However, knowledge of how sport participation is associated with psychological status and life satisfaction during adolescence is insufficient. This study aims to explore sport participation in a university-based sample of youths, and to analyze how it correlated with mental health and life satisfaction. A total of 495 university students were recruited. The instruments included demographic characteristics questionnaire and previously validated measures such as Sport Participation (SLIM-18), Perceived Stress Scale (PSS-10), as well as The Satisfaction with Life Scale (SWLS) questionnaires. The research results observed that students' sports participation and perception of stress were fall into the moderate category with percentage of 77.2% and 70.3, respectively. While life satisfaction was fall into neutral category (70.7%). The differences in sports participation and stress were significantly different ($p < 0.05$) between genders, but not with life satisfaction ($p > 0.05$). Sports participation was negatively correlated with perceived stress ($p < 0.05$), but positively related to life satisfaction ($p < 0.01$), while perceived stress was negatively associated with life satisfaction ($p < 0.01$). Sports participation plays a crucial role in reducing mental health problems and improving psychological well-being of students during their university time. It also positively promotes higher life satisfaction and better physical as well as mental health.

Keywords: life satisfaction, mental health, physical activity, sport participation, stress, student

INTRODUCTION

The association between physical and mental health has been observed and studied since thousand years ago, yielding “*men sana in corpore sano*”, the Latin phrase which means a healthy mind in a healthy body (Fossati et al., 2021). The scientific researches provide several evidences of concept regarding this hypothesis, with many literatures analysing the role of physical activity on mental health as well as the role of mental health on physical performance (Aparicio et al., 2019; Fossati et al., 2020). The improvement of physical performance requires certain strategies to address the influence of lifestyle on psychological state (Alam & Rufo, 2019), especially for specific population such as adolescents and young adults. The transitional phase from adolescence into early adulthood reflects an important period that might have a distinct impact on the adaptation and adoption of health behaviours, resulting in healthy body and healthy state of mind (Jaworska & MacQueen, 2015; Vankim & Nelson, 2013). Therefore, the one of the efforts to prevent mental disturbances during this critical period is through promoting competitive and recreational sport participation (Fossati et al., 2021).

There is a clear difference between physical activity or exercise and sport participation (Fossati et al., 2021). In some studies assessing mental health in youth population, physical activity (PA) was described as participation in any competitive or recreational exercise/sport (Pfisterer et al., 2022). Meanwhile, sport participation was defined as purposely active in participating in sport-related physical activity during leisure-time (Deelen et al., 2018). The World Health Organization has highlighted the importance of sport participation to the health and development of adolescents (Cairney & Veldhuizen, 2017). Regular participation in sport activity offers many health benefits such as reduces body fat, improves bone health and physical fitness, and increases other favourable cardiovascular profiles (Eime et al., 2013; Ridwan et al., 2022). With that many positive impacts on health, yet previous cross sectional studies showed a large decrease in PA level and sport participation, especially in adolescents, young adults, and above 65 years old (Zimmermann-Sloutskis et al., 2010).

The decrease level of sport participation in adolescents is special concern as study found that youths are likely to be more physically inactive as their age increase (Guddal et al., 2019). Adolescent is a critical period due to healthy habit and behaviours including engaging in any kind of regular physical activity, exercise, or sport are often developed during this time, paving the way for long-term health in later life (Guddal et al., 2019; Wilson et al., 2021). According to Indonesian Central Bureau of Statistic (2021), there was approximately 8.96 million or 13.6% youths (age 18–24 years) in Indonesia attended college in 2021, reflecting an important mass of the young adult population (Hallal et al., 2012). With this big number, maintaining body to be physically active during the transitional period from adolescents into adulthood becomes major public health challenge (Bélanger et al., 2015).

Mental health problem such as stress and anxiety are other important challenges among adolescents (Herdyanto et al., 2020). In addition to decreased motivation to participate in sport, the transformation phase to university or college can be socially and academically frustrating for students (Worsley et al., 2021). In previous research assessing mental health among university students, around 60% of subjects experienced high or very high stress (McMahon et al., 2017). Data generated in a last decade from the Behavioural Risk Factor Surveillance System reported that students ages 18–24 show the greatest prevalence of depressive symptoms compared to other populations (Kieling et al., 2011). The same high number was also seen in Indonesian youth, where depression prevalence in the 15-24 year-old population according to National Institute of Health Research and Development (2019) was 6.2%.

The aforementioned mental health disorders also tend to carry over into adulthood with all of its impact that will be acquired in later life, representing the urgency of preventive effort during adolescent period (Bertha & Balázs, 2013). Thus, we conduct this study to analyse sport participation among university students in Indonesia, and to explore associations between sport participation, perceived stress, and life satisfaction among students, especially freshmen across major.

METHOD

Study design and participants

This research was quantitative descriptive study using a cross-sectional design. The participants were undergraduate students majored in sport and non-sport courses in universities located in East Java. The participants enrolled in this study were recruited only if they met following criteria: (1) above 18 years old; (2) registered as active students in one of the faculties at the time of data collection in any academic level (first to fourth year); (3) consent to participate in this study. Ultimately, a total of 511 respondents met the inclusion criteria. After excluding those who failed to complete the entire questionnaire or gave invalid responses, the final participants were 495 students in total, consisting of 254 males dan 241 females. This research was approved by the ethics committee of X University in Surabaya, Indonesia, number 206/EA/KEPK/2023.

Data collection

The questionnaire consisting of self-administrated demographic questions (e.g. age, gender, height, bodyweight, body mass index) followed by a set of instruments to assess sport participation, perceived stress (PS), life satisfaction (LS). Before taking part in the study, all students were provided a written informed consent which appeared at the first page of the questionnaire to inform the participants the terms and conditions of the study as well as the ethical permission. The participants were permitted to complete the questionnaires only after they signed it. Data were collected in August to September 2023. Response was removed or partially excluded if it met the following reasons: 1) invalid or abnormal responses; 2) abstinent.

Sport participation

Data on sports participation among students was obtained through the Baecke (1982) questionnaire. Baecke (1982) divides physical activity into physical activity during work, sports, and free time. However, the data in this study only used data about sports activities carried out, including activities that cause sweating. We determined sports participation through sports index scores obtained from the Baecke questionnaire and categorized them based on mean and standard deviation (SD). Sports participation was classified into high ($x \geq 5.32$), medium ($3.6 \leq x < 5.32$), and low ($x < 3.6$).

Perceived Stress Scale (PSS-10)

Perceived Stress Scale (PSS-10) is a stress assessment instrument comprised of 10 questions with several options. The Indonesian version of the questionnaire was translated and modified from Klein et al (2016a). Respondents or participants reported the degree to which circumstances in one’s life have been uncontrollable, unpredictable, and overloaded during the past month. The degree was listed on a five-point Likert scale (0=never, 1=almost never, 2=sometimes, 3=quite often, 4=very often). Scores for the four positively-stated items (statement 4, 5, 7, 8) were reversed. A final cumulative score on the PSS may range from 0 to 40, which higher scores representing higher perceived stress. The final score of each respondent was then classified into three categories: low stress (0-13); moderate stress (14-26); and high stress (27-40).

The Satisfaction with Life Scale (SWLS)

The Satisfaction with Life Scale (SWLS) is a five-item scale designed to assess a person’s general appraisal of life satisfaction. Respondents were asked to give a rating on how much they agreed or disagreed with each of the five items: (a) in many ways my life is close to my ideal; (b) my living conditions are very good; (c) I am content with my life; (d) I have obtained the significant things I want in life so far; and (e) if I could live my life, I would change almost nothing. Each item was rated using a seven-point scale ranging from the highest (7—strongly agree) to the lowest (1—strongly disagree). Higher scores represent greater satisfaction in life. The final score was then accumulated and classified into three categories: dissatisfied (SWLS score 5-19); neutral (SWLS score 20-25); satisfied (SWLS 26-35). SWLS has quite satisfactory reliability ($\alpha= 0.84$) and inter-item correlation ($r>0.60$) (Galanakis, 2017).

Data analysis

Socio-demographic factors, sports participation, perceived stress, and life satisfaction score were presented using descriptive statistic (mean \pm SD, frequency, and percentage). In addition to descriptive statistic, follow up analysis like independent t-test was performed to analyze significant difference between gender. Furthermore, Pearson correlation and linear regression were performed to evaluate the association between sports participation, stress, and life satisfaction. P-values < 0.05 were considered statistically significant.

RESULTS

Data in present study was collected by completing a set of questionnaires on sports participation by calculating the sports index value, the Perceived Stress Scale (PSS-10) questionnaire to determine stress perceptions and the Satisfaction with Life Scale (SWLS) questionnaire to determine measures a person’s global cognitive assessment of life satisfaction.

Table 1. Descriptive statistic of university students

| Variable | All | Male | Female | Sig. |
|--------------------------------------|--------------------|--------------------|-------------------|--------|
| Age | 18.31 \pm 0.67 | 18.38 \pm 0.73 | 18.24 \pm 0.59 | 0.030* |
| Bodyweight (kg) | 57.79 \pm 13.98 | 63.12 \pm 15.35 | 52.18 \pm 9.61 | 0.000* |
| Height (cm) | 162.91 \pm 10.94 | 167.79 \pm 12.41 | 157.77 \pm 5.68 | 0.000* |
| Body mass index (kg/m ²) | 22.77 \pm 22.37 | 24.49 \pm 30.96 | 20.95 \pm 3.57 | 0.006* |
| Sport participation | 4.46 \pm 0.86 | 4.71 \pm 0.9 | 4.19 \pm 0.65 | 0.000* |
| Perceived stress | 17.48 \pm 5.97 | 16.55 \pm 5.87 | 18.47 \pm 5.92 | 0.000* |
| Life satisfaction | 22.99 \pm 5.37 | 23.08 \pm 5.64 | 22.91 \pm 5.08 | 0.244 |

*All data were presented in mean and standard deviation (mean \pm SD)
 * significantly different between male and female ($p \leq 0.05$)*

Table 1 showed that the average age (18.38 \pm 0.73), bodyweight (63.12 \pm 15.35), height (167.79 \pm 12.41), and body mass index (24.49 \pm 30.96) in male students were higher compared to females and both genders. The average score of sports participation and perceived stress between male and female students were significantly different ($p=0.000$), but the same result was not found in life satisfaction between males and females ($p=0.244$).

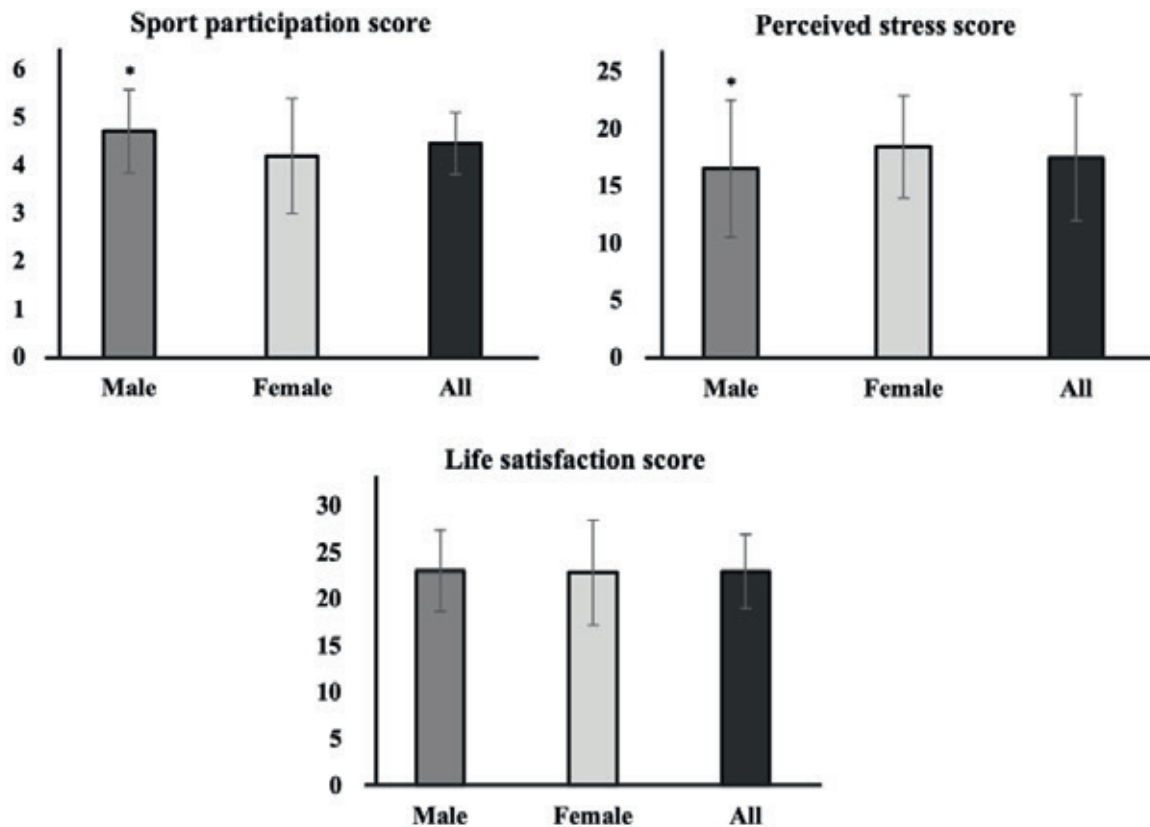


Figure 1. The comparison analysis of the mean score of sports participation, perceived stress, and life satisfaction between genders. Description: (*) significantly different with female groups ($p \leq 0.05$). Data were presented in mean \pm SD.

From Table 2, it could be seen that majority of students had moderate level of sports participation (77.2%). Most of them also had moderate level of stress (70.3%) and their life satisfaction level fell into neutral category (70.7%).

Table 2. The classification of sports participation, perceived stress, and life satisfaction (N=495)

| Variable | Category | Frequency (n) | Percentage (%) |
|----------------------|--------------|---------------|----------------|
| Sports participation | Low | 46 | 9.3 |
| | Moderate | 382 | 77.2 |
| | High | 67 | 13.5 |
| Perceived stress | Low | 119 | 24.0 |
| | Moderate | 348 | 70.3 |
| | High | 28 | 5.7 |
| Life satisfaction | Dissatisfied | 71 | 14.3 |
| | Neutral | 350 | 70.7 |
| | Satisfied | 74 | 14.9 |

In the correlation test, it can be seen that perceived stress is negatively associated with sports participation ($p=0.025$, $r=-0.101$) and life satisfaction ($p=0.000$, $r=-0.283$), although the correlations are weak. The negative correlation between those variables means the higher perceived stress, the less students' participation in sports and the less they feel satisfied with their life. On the other hand, Pearson correlation test also reveals that sports participation is positively correlated with life satisfaction ($p=0.003$), which means that the higher sports participation, the more life satisfaction score will increase (Figure 2).

The regression coefficient value for the sports participation variable has a positive value of 0.655. This shows that if sports participation increases by 1%, then life satisfaction will increase by 0.655, assuming other variables are

held constant. Meanwhile, the stress perception variable has a negative relationship with life satisfaction, which is, if perceived stress score increases by 1%, then life satisfaction will decrease by 0.245 (Table 3).

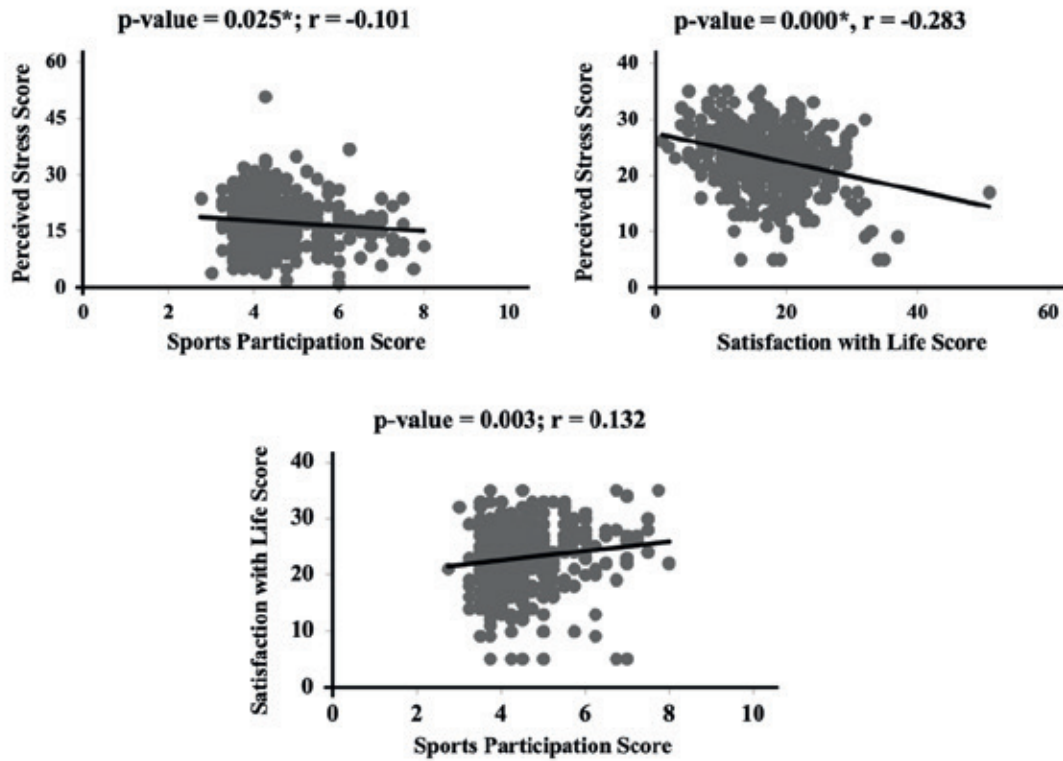


Figure 2. Correlation between measured variables.

Description: (*) significantly different with female groups ($p \leq 0.05$)

Table 3. Linier regression of sports participation, perceived stress, and life satisfaction

| Model | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|------------------------|-----------------------------|------------|---------------------------|--------|------|
| | B | Std. Error | Beta | | |
| (Constant) | 24.362 | 1.460 | | 16.688 | .000 |
| 1 Sports participation | .655 | .270 | .105 | 2.427 | .016 |
| Perceived stress | -.245 | .039 | -.273 | -6.313 | .000 |

a. Dependent Variable: Life satisfaction

DISCUSSION

In this cross-sectional study, we observed that the highest percentages of sports participation, perceived stress (PS), and life satisfaction (LS) among university students fell in the medium category. Based on the result of comparison test, there was a significant difference ($p < 0.05$) in sports participation and perceived stress between male and female students, while life satisfaction did not show significant different ($p > 0.05$). The difference in sports participation between male and female is in line with research conducted by Wang & Boros (2019) that gender differences in physical exercise were very significant, as male participated more in sports than women. This gender difference might also be due to differences in motivation for physical activity (Kilpatrick et al., 2005).

The perception of stress in male and female students is significantly different, this is in accordance with findings reported in the literature, that female generally have higher stress scores and emotional intensity than male (di Fronso et al., 2020). These results are also in line with other research which shows that women have more stressful lives than men

(Costa et al., 2021). A large population-based study in Europe also found higher mean of perceived stress scores (PSS) in female compared to male (Klein et al., 2016b). Women are likely to be more frustrated and more susceptible to common psychological problems such as depression, stress, and anxiety compared to men (Sandanger et al., 2004). Some people also think that the problems that women often face more compared to men are doubtful-minded, low self-esteem, and self-blame (Asztalos et al., 2012). This might explain why female students in present study reported higher perceived stress compared to their counterpart.

Life satisfaction defined as building emotional judgments by comparing themselves with what is appropriate, and expected, or reasonably demanded (Sirgy et al., 2010). In the results of this study, the life satisfaction scores of male and female students did not differ significantly, which is in accordance with previous researches conducted by Chan (2005) and Mayungbo (2016) that gender differences did not affect life satisfaction. However, contradictory findings were observed in other studies that men have a lower level of life satisfaction than women (Al-Attayah & Nasser, 2016; Capri et al., 2012; Tükel & Temel, 2020; Turgut, 2021). The average age of students in this study was around 18 years, it might be explained why life satisfaction between male and female student is similar, as previous study observed that the increasing age will be followed by the increase of life satisfaction (Capri et al., 2012), but life satisfaction can vary at certain stages of human life (Myers & Diener, 1995).

Furthermore, another finding from this research is that sports participation was negatively associated with perceived stress, meaning that the higher the sports participation, the lower the perceived stress. Increased stress for students can occur due to many factors such as pressure to adapting to new environment, poor social skills and time management, and heavy coursework they are taking on (Barbayannis et al., 2022; Reddy et al., 2018). Sports participation plays an important role in reducing mental health problems and improving psychological well-being (Herdyanto et al., 2020). Physical activity and psychological stress and are believed to be interrelated, which resulted in physical inactivity (Stults-Kolehmainen & Sinha, 2014). Likewise, in previous study done by Eather et. al. (2023) showed that sports participation in any form (team or individual) brings positive impacts for enhancing psychological state as well as social outcomes among adults. However, team sports is believed to give more additional benefits on mental and social outcomes for adults in later life.

Meanwhile, sports participation is positively related to life satisfaction, which means that the higher sports participation, the more life satisfaction will increase. Previous study stated a two-way correlation between physical activity and life satisfaction (Steptoe, 2019). Physical activity is an important healthy lifestyle (Wibawa et al., 2020), which can increase life satisfaction, and people with higher life satisfaction may participate in more physical activity (Kim et al., 2017). This is in accordance with previous literature that people with higher levels of physical activity tend to have higher life satisfaction and happiness (An et al., 2020). The findings of present study are also in accordance with earlier study which revealed a positive relationship between life satisfaction and sports activities carried out in their free time, so that people tend to participate more in leisure activities as long as they feel satisfied with their lives (Cho, 2019).

Another negative correlation is also observed between and perceived stress and life satisfaction ($p < 0.001$). Previous research that highlighted the influence of stress in estimating life satisfaction shows that higher stress predicts lower life satisfaction (Extremera et al., 2009). Academic stress faced by students has an impact not only on their performance in school but also on their overall quality of life (DelaCruz et al., 2022). Despite another research shows contrast finding that the level of perceived stress and overall quality of life scores do not have a strong relationship, present study believes that the level of perceived stress is related to the physical health component of quality of life.

CONCLUSION

Sports participation plays a crucial role in reducing psychological problems, improving healthy mind and well-being. For students, it is very important to increase sports participation in order to avoid stress and maintain mental health. Students who actively participate in sports tend feel more satisfied and fulfilled with their lives than those who are not actively engage in sports, as sport plays a significant role in maintaining both mental and physical health, thus it may improve quality of life and well-being.

REFERENCES

- Alam, N., & Rufo, N. (2019). Fitness as a Component of Mental Health Intervention. *Health & Social Work, 44*(2), 129–132. <https://doi.org/10.1093/hsw/hlz001>
- Al-Attayah, A., & Nasser, R. (2016). Gender and age differences in life satisfaction within a sex-segregated society: Sampling youth in Qatar.

- International Journal of Adolescence and Youth*, 21(1), 84–95. <https://doi.org/10.1080/02673843.2013.808158>
- An, H. Y., Chen, W., Wang, C. W., Yang, H. F., Huang, W. T., & Fan, S. Y. (2020). The relationships between physical activity and life satisfaction and happiness among young, middle-aged, and older adults. *International Journal of Environmental Research and Public Health*, 17(13), 1–10. <https://doi.org/10.3390/ijerph17134817>
- Aparicio, V. A., Marín-Jiménez, N., Coll-Risco, I., de la Flor-Aleman, M., Baena-García, L., Acosta-Manzano, P., & Aranda, P. (2019). Doctor, ask your perimenopausal patient about her physical fitness; association of self-reported physical fitness with cardiometabolic and mental health in perimenopausal women: The FLAMENCO project. *Menopause (New York, N.Y.)*, 26(10), 1146–1153. <https://doi.org/10.1097/GME.0000000000001384>
- Asztalos, M., Wijndaele, K., De Bourdeaudhuij, I., Philippaerts, R., Matton, L., Duvinéaud, N., Thomis, M., Lefevre, J., & Cardon, G. (2012). Sport participation and stress among women and men. *Psychology of Sport and Exercise*, 13(4), 466–483. <https://doi.org/10.1016/j.psychsport.2012.01.003>
- Barbayannis, G., Bandari, M., Zheng, X., Baquerizo, H., Pecor, K. W., & Ming, X. (2022). Academic Stress and Mental Well-Being in College Students: Correlations, Affected Groups, and COVID-19. *Frontiers in Psychology*, 13. <https://www.frontiersin.org/articles/10.3389/fpsyg.2022.886344>
- Bélanger, M., Sabiston, C. M., Barnett, T. A., O’Loughlin, E., Ward, S., Contreras, G., & O’Loughlin, J. (2015). Number of years of participation in some, but not all, types of physical activity during adolescence predicts level of physical activity in adulthood: Results from a 13-year study. *The International Journal of Behavioral Nutrition and Physical Activity*, 12, 76. <https://doi.org/10.1186/s12966-015-0237-x>
- Bertha, E. A., & Balázs, J. (2013). Subthreshold depression in adolescence: A systematic review. *European Child & Adolescent Psychiatry*, 22(10), 589–603. <https://doi.org/10.1007/s00787-013-0411-0>
- Cairney, J., & Veldhuizen, S. (2017). Organized sport and physical activity participation and body mass index in children and youth: A longitudinal study. *Preventive Medicine Reports*, 6, 336–338. <https://doi.org/10.1016/j.pmedr.2017.04.005>
- Capri, B., Ozkendir, O. M., Ozkurt, B., & Karakus, F. (2012). General Self-Efficacy beliefs, Life Satisfaction and Burnout of University Students. *Procedia - Social and Behavioral Sciences*, 47, 968–973. <https://doi.org/10.1016/j.sbspro.2012.06.765>
- Central Bureau of Statistics. (2021). *Data Penduduk Indonesia*. Central Bureau of Statistics.
- Chan, G., Miller, P. W., & Tcha, M. (2005). Happiness In University Education. *International Review of Economics Education*, 4(1), 20–45. [https://doi.org/10.1016/S1477-3880\(15\)30139-0](https://doi.org/10.1016/S1477-3880(15)30139-0)
- Cho, H. (2019). Importance of leisure nostalgia on life satisfaction and leisure participation. *Service Industries Journal*, 40(1–2), 90–109. <https://doi.org/10.1080/02642069.2019.1567714>
- Costa, C., Briguglio, G., Mondello, S., Teodoro, M., Pollicino, M., Canalella, A., Verduci, F., & Italia, S. (2021). Perceived Stress in a Gender Perspective: A Survey in a Population of Unemployed Subjects of Southern Italy. *Front. Public Health*, 9(640454), 1–9. <https://doi.org/10.3389/fpubh.2021.640454>
- Deelen, I., Ettema, D., & Kamphuis, C. B. M. (2018). Sports participation in sport clubs, gyms or public spaces: How users of different sports settings differ in their motivations, goals, and sports frequency. *PLoS ONE*, 13(10), e0205198. <https://doi.org/10.1371/journal.pone.0205198>
- DelaCruz, P. J., Aquino, A. M., Curioso, M., Tia, D. J., Samonte, S. L., & Policarpio, J. G. (2022). The Impact of Stress to the Quality of Life of the College Students During the COVID-19 Pandemic. *Psychology and Education: A Multidisciplinary Journal*, 2(3), 196–211. <https://doi.org/10.5281/zenodo.6626151>
- di Fronso, S., Costa, S., Montesano, C., Di Gruttola, F., Ciofi, E. G., Morgilli, L., Robazza, C., & Bertollo, M. (2020). The effects of COVID-19 pandemic on perceived stress and psychobiosocial states in Italian athletes. *International Journal of Sport and Exercise Psychology*, 0(0), 1–13. <https://doi.org/10.1080/1612197X.2020.1802612>
- Eather, N., Wade, L., Pankowiak, A., & Eime, R. (2023). The impact of sports participation on mental health and social outcomes in adults: A systematic review and the ‘Mental Health through Sport’ conceptual model. *Systematic Reviews*, 12(1), 102. <https://doi.org/10.1186/s13643-023-02264-8>
- Eime, R. M., Young, J. A., Harvey, J. T., Charity, M. J., & Payne, W. R. (2013). A systematic review of the psychological and social benefits of participation in sport for children and adolescents: Informing development of a conceptual model of health through sport. *The International Journal of Behavioral Nutrition and Physical Activity*, 10, 98. <https://doi.org/10.1186/1479-5868-10-98>
- Extremera, N., Durán, A., & Rey, L. (2009). The moderating effect of trait meta-mood and perceived stress on life satisfaction. *Personality and Individual Differences*, 47(2), 116–121. <https://doi.org/10.1016/j.paid.2009.02.007>
- Fossati, C., Torre, G., Borriore, P., Giombini, A., Fagnani, F., Turchetta, M., Albo, E., Casasco, M., Parisi, A., & Pigozzi, F. (2020). Biohumoral Indicators Influenced by Physical Activity in the Elderly. *Journal of Clinical Medicine*, 9(4), 1115. <https://doi.org/10.3390/jcm9041115>
- Fossati, C., Torre, G., Vasta, S., Giombini, A., Quaranta, F., Papalia, R., & Pigozzi, F. (2021). Physical Exercise and Mental Health: The Routes of a Reciprocal Relation. *International Journal of Environmental Research and Public Health*, 18(23), 12364. <https://doi.org/10.3390/ijerph182312364>
- Galanakis, M. (2017). Reliability and Validity of the Satisfaction with Life Scale (SWLS) in a Greek Sample. *The International Journal of Humanities & Social Studies*. <https://internationaljournalcorner.com/index.php/theijhss/article/view/125249>
- Guddal, M. H., Stensland, S. Ø., Småstuen, M. C., Johnsen, M. B., Zwart, J.-A., & Storheim, K. (2019). Physical activity and sport participation among adolescents: Associations with mental health in different age groups. Results from the Young-HUNT study: a cross-sectional survey. *BMJ Open*, 9(9), e028555. <https://doi.org/10.1136/bmjopen-2018-028555>
- Hallal, P. C., Andersen, L. B., Bull, F. C., Guthold, R., Haskell, W., Ekelund, U., & Lancet Physical Activity Series Working Group. (2012). Global physical activity levels: Surveillance progress, pitfalls, and prospects. *Lancet (London, England)*, 380(9838), 247–257. [https://doi.org/10.1016/S0140-6736\(12\)60646-1](https://doi.org/10.1016/S0140-6736(12)60646-1)
- Herdianto, Y., Nurhasan, Ardha, M. A. A., Agustia, D., Sholikhah, A. M., & Fathir, L. W. (2020). *Mental Health Condition During COVID-19 Pandemic in Trained and Non-Trained Adults*. 1430–1438. <https://doi.org/10.2991/assehr.k.201201.242>
- Jaworska, N., & MacQueen, G. (2015). Adolescence as a unique developmental period. *Journal of Psychiatry & Neuroscience : JPN*, 40(5), 291–293. <https://doi.org/10.1503/jpn.150268>

- Kieling, C., Baker-Henningham, H., Belfer, M., Conti, G., Ertem, I., Omigbodun, O., Rohde, L. A., Srinath, S., Ulkuer, N., & Rahman, A. (2011). Child and adolescent mental health worldwide: Evidence for action. *The Lancet*, 378(9801), 1515–1525. [https://doi.org/10.1016/S0140-6736\(11\)60827-1](https://doi.org/10.1016/S0140-6736(11)60827-1)
- Kilpatrick, M., Hebert, E., & Bartholomew, J. (2005). College Students' Motivation for Physical Activity: Differentiating Men's and Women's Motives for Sport Participation and Exercise. *Journal of American College Health*, 54(2), 87–94. <https://doi.org/10.3200/JACH.54.2.87-94>
- Kim, E. S., Kubzansky, L. D., Soo, J., & Boehm, J. K. (2017). Maintaining Healthy Behavior: A Prospective Study of Psychological Well-Being and Physical Activity. *Annals of Behavioral Medicine*, 51(3), 337–347. <https://doi.org/10.1007/s12160-016-9856-y>
- Klein, E. M., Brähler, E., Dreier, M., Reinecke, L., Müller, K. W., Schmutzer, G., Wölfling, K., & Beutel, M. E. (2016a). The German version of the Perceived Stress Scale – psychometric characteristics in a representative German community sample. *BMC Psychiatry*, 16(1), 159. <https://doi.org/10.1186/s12888-016-0875-9>
- Klein, E. M., Brähler, E., Dreier, M., Reinecke, L., Müller, K. W., Schmutzer, G., Wölfling, K., & Beutel, M. E. (2016b). The German version of the Perceived Stress Scale—Psychometric characteristics in a representative German community sample. *BMC Psychiatry*, 16(1), 1–10. <https://doi.org/10.1186/s12888-016-0875-9>
- Lordan, G., & Pakrashi, D. (2014). Make Time for Physical Activity or You May Spend More Time Sick! *Social Indicators Research*, 119(3), 1379–1391. <https://doi.org/10.1007/s11205-013-0545-y>
- Mayungbo, O. A. (2016). Gender differences, self esteem and life satisfaction. *African Journal for the Psychological Study of Social Issues*, 19(2), Article 2.
- McMahon, E. M., Corcoran, P., O'Regan, G., Keeley, H., Cannon, M., Carli, V., Wasserman, C., Hadlaczy, G., Sarchiapone, M., Apter, A., Balazs, J., Balint, M., Bobes, J., Brunner, R., Cozman, D., Haring, C., Iosue, M., Kaess, M., Kahn, J.-P., ... Wasserman, D. (2017). Physical activity in European adolescents and associations with anxiety, depression and well-being. *European Child & Adolescent Psychiatry*, 26(1), 111–122. <https://doi.org/10.1007/s00787-016-0875-9>
- Myers, D. G., & Diener, E. (1995). Who Is Happy? *Psychological Science*, 6(1), 10–19. <https://doi.org/10.1111/j.1467-9280.1995.tb00298.x>
- National Institute of Health Research and Development. (2019). *Indonesia Basic Health Survey (RISKESDAS) 2018*. National Institute of Health Research and Development.
- Pfisterer, J., Rausch, C., Wohlfarth, D., Bachert, P., Jekauc, D., & Wunsch, K. (2022). Effectiveness of Physical-Activity-Based Interventions Targeting Overweight and Obesity among University Students—A Systematic Review. *International Journal of Environmental Research and Public Health*, 19(15), 9427. <https://doi.org/10.3390/ijerph19159427>
- Reddy, K. J., Menon, K. R., & Thattai, A. (2018). Academic Stress and its Sources Among University Students. *Biomedical and Pharmacology Journal*, 11(1), 531–537.
- Ridwan, M., Sholikhah, A. M., & Prakoso, B. B. (2022). Health literacy and health-related behavior in sport among University students in East Java, Indonesia: A cross sectional study. *Journal Sport Area*, 7(1), 104–116. [https://doi.org/10.25299/sportarea.2022.vol7\(1\).809](https://doi.org/10.25299/sportarea.2022.vol7(1).809)
- Sandanger, I., Nygård, J. F., Sørensen, T., & Mow, T. (2004). Is women's mental health more susceptible than men's to the influence of surrounding stress? *Social Psychiatry and Psychiatric Epidemiology*, 39(3), 177–184. <https://doi.org/10.1007/s00127-004-0728-6>
- Sirgy, M. J., Widgey, R. N., Lee, D. J., & Yu, G. B. (2010). Developing a measure of community well-being based on perceptions of impact in various life domains. *Social Indicators Research*, 96(2), 295–311. <https://doi.org/10.1007/s11205-009-9479-9>
- Steptoe, A. (2019). Happiness and Health. *Annual Review of Public Health*, 40, 339–359. <https://doi.org/10.1146/annurev-publhealth-040218-044150>
- Stults-Kolehmainen, M. A., & Sinha, R. (2014). The effects of stress on physical activity and exercise. In *Sports Medicine* (Vol. 44, Issue 1). <https://doi.org/10.1007/s40279-013-0090-5>
- Tükel, Y., & Temel, A. S. (2020). Examining the levels of freedom, life satisfaction and happiness perceived by college students in leisure time. *International Journal of Research in Education and Science*, 6(4), 668–678. <https://doi.org/10.46328/ijres.v6i4.1451>
- Turgut, M. (2021). Sportive university students and life satisfaction. *Cypriot Journal of Education*, 16(1), 423–435.
- Vankim, N. A., & Nelson, T. F. (2013). Vigorous physical activity, mental health, perceived stress, and socializing among college students. *American Journal of Health Promotion: AJHP*, 28(1), 7–15. <https://doi.org/10.4278/ajhp.111101-QUAN-395>
- Wang, F., & Boros, S. (2019). The relationship between physical activity, stress, life satisfaction and sleep quality. *Journal of Physical Education and Sport*, 19(1), 227–234. <https://doi.org/10.7752/jpes.2019.s1034>
- Wibawa, J. C., Wati, L. H., & Arifin, M. Z. (2020). Mekanisme Vitamin C Menurunkan Stres Oksidatif Setelah Aktivitas Fisik. *JOSSAE (Journal of Sport Science and Education)*, 5(1), Article 1. <https://doi.org/10.26740/jossae.v5n1.p57-63>
- Wilson, O. W. A., Walters, S. R., Naylor, M. E., & Clarke, J. C. (2021). Physical Activity and Associated Constraints Following the Transition From High School to University. *Recreational Sports Journal*, 45(1), 52–60. <https://doi.org/10.1177/1558866121995138>
- Worsley, J. D., Harrison, P., & Corcoran, R. (2021). Bridging the Gap: Exploring the Unique Transition From Home, School or College Into University. *Frontiers in Public Health*, 9, 634285. <https://doi.org/10.3389/fpubh.2021.634285>
- Zimmermann-Sloutskis, D., Wanner, M., Zimmermann, E., & Martin, B. W. (2010). Physical activity levels and determinants of change in young adults: A longitudinal panel study. *International Journal of Behavioral Nutrition and Physical Activity*, 7(1), 2. <https://doi.org/10.1186/1479-5868-7-2>

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