

SUBMISSION



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[TMFV] Submission Acknowledgement

1 message

Oleg Khudolii <mailer@tmfv.com.ua>

Sat, Sep 10, 2022 at 2:23 PM

To: Agus Hariyanto <agushariyanto@unesa.ac.id>, Anindya Mar'atus Sholikhah <anindyasholikhah@unesa.ac.id>, Afif Rusdiawan <afifrusdiawan@unesa.ac.id>, Indra Himawan Susanto <indrasusanto@unesa.ac.id>, Mochammad Purnomo <mochamadpurnomo@unesa.ac.id>

Hello,

Yetty Septiani Mustar has submitted the manuscript, "Physical Activity Level Amongst University Students and Lecturers Across Majors and Programs in Indonesia" to Physical Education Theory and Methodology.

If you have any questions, please contact me. Thank you for considering this journal as a venue for your work.

Oleg Khudolii

FEEDBACK DAN EDITOR DECISION



Agus Hariyanto . <agushariyanto@unesa.ac.id>

[TMFV] Editor Decision

Oleg M. Khudolii via TMFV Journal <mailer@tmfv.com.ua>

Tue, Jan 3, 2023 at 11:29 PM

Reply-To: "Oleg M. Khudolii" <tmfv@tmfv.com.ua>

To: Agus Hariyanto <agushariyanto@unesa.ac.id>, Yetty Septiani Mustar <yettymustar@unesa.ac.id>, Anindya Mar'atus Sholikhah <anindyasholikhah@unesa.ac.id>, Afif Rusdiawan <afifrusdiawan@unesa.ac.id>, Indra Himawan Susanto <indrasusanto@unesa.ac.id>, Mochammad Purnomo <mochamadpurnomo@unesa.ac.id>

Agus Hariyanto, Yetty Septiani Mustar, Anindya Mar'atus Sholikhah, Afif Rusdiawan, Indra Himawan Susanto, Mochammad Purnomo:

Dear Authors,

We'd like to inform you that your article "Physical Activity Level Amongst University Students and Lecturers Across Majors and Programs in Indonesia" has been approved for publication in *Physical Education Theory and Methodology*.

Scheduled for publication in Volume 23, Number 1

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1 **Physical Activity Level Amongst University Students and Lecturers**

2 **Across Majors and Programs in Indonesia**

3 **Abstract**

4 **Background.** Physical inactivity is the fourth leading risk factor contributing to the rapid
5 increase in global mortality. The number is increasing in all sectors, with higher education
6 institutions no exception. With university lecturers and students' issues related to health and
7 well-being are becoming more prevalent, the need to engage more time in doing physical
8 activity becomes more important.

9 **The purpose of this study** is to estimate the current physical activity level of students and
10 lecturers across faculties and majors.

11 **Materials and methods.** A cross-sectional study was conducted among 2698 students and 355
12 lecturers in November 2021. They completed an online Global Physical Activity Questionnaire
13 (GPAQ) and reported the number of days and duration of activities they spent studying or
14 working, travelling, and recreational activities. All responses to the duration were converted
15 from hours into METs. Statistical analysis and data entry was performed using SPSS version
16 21.

17 **Results.** A significant difference was found in METs scores between lecturers and students in
18 three majors: Economics, Sports Science, and Science Education ($p < 0.05$). Other findings
19 showed that the PA level among students and lecturers were found in the moderate category,
20 although the low level of physical activity was also higher. Lack of physical activity is a major
21 risk factor for non-communicable diseases and has a negative effect on the quality of life and
22 mental health.

23 **Conclusions.** Therefore, the university needs to carefully design policies and strategies to
24 promote and enhance the physical activity and well-being of students, lecturers, staff, and all
25 people involved.

26 **Keywords:** physical fitness, METs, lecturer, student, college.

27 **Introduction**

28 Previous studies have well-documented numerous health benefits of physical activity (PA) and
29 exercise, with participation in moderate-intensity of physical activity on a daily basis is proved
30 to enhance both the physical (Lee, Shiroma, Lobelo, Puska, Blair, Katzmarzyk, et al., 2012)
31 and mental health (Chu et al., 2014; Kim et al., 2012), besides maintaining fitness level to

improve quality of life (Rodríguez-Fernández & Ramos-Díaz, 2017). It is reiterated with a study conducted by Elmagd (2016), which states that physical activity and exercise can reduce anxiety and stress, increase self-confidence, sharpen brain memory and increase muscle and bone strength. Regular physical activity is also found to lower the risk of non-communicable diseases such as type 2 diabetes, cardiovascular diseases, musculoskeletal disorders, prevent depression, and cancers (Anderson & Durstine, 2019; Harvey et al., 2018; Moore et al., 2016; Safi et al., 2021; Saqib et al., 2020). Despite the many positive impacts of physical activity, nearly 60% of the world's population fails to meet the recommended duration (Guthold et al., 2020; Rajappan et al., 2015; Van Dyck et al., 2015), which is accumulated at least 150 minutes of moderate to vigorous PA (MVPA) every week as suggested by WHO (2020). Inadequate physical activity contributes to the rapid-growing proportion of chronic diseases (WHO, 2009), which account for almost half the total global burden of diseases (Mathers, 2020).

There is notable evidence reported the decreased participation in physical activity through adolescence, and this trend continues with the increase of age throughout adulthood (Calestine et al., 2017). In the university setting, the number of people who did not participate in regular physical activity was also seen to rise (Calestine et al., 2017; Safi et al., 2021), with many undergraduate students (Alkhateeb et al., 2019) and staffs (Fountaine et al., 2014) were found to be inactive. A previous study conducted by Pengpid & Peltzer (2021) on undergraduate students in 23 countries found that 41.4% failed to meet the recommended physical activity (PA) levels based on a thorough assessment of the overall PA (Acebes-Sánchez et al., 2019). In compliance with the findings, recent WHO reported that 15% of adults of all types of jobs, including teachers in the South-East Asia region, were not compliant with the WHO recommended levels of PA (Uddin et al., 2017).

Previous studies provide several explanations that may suggest why many students, teachers, and adults do not actively engage in regular physical activity. For instance, evidence suggests that "time availability" is the primary barrier that prevents adults from fulfilling the recommended guideline of physical activity (Brown et al., 2014; Edmunds et al., 2013; Joseph et al., 2015; Safi et al., 2021), such as lack of free time due to tight schedule at school or university or obligation in social and family life (Kljajević et al., 2022). Long periods of sedentary time has also been found to be the major cause of the decline in physical activity among the university community, especially during the pandemic situation as it led them to be confined to their homes (Fountaine et al., 2014; Hermassi et al., 2021; Legido-Quigley et al., 2020; Romero-Blanco et al., 2020; Runacres et al., 2021).

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65 A suggestion from a previous study proposed that research must focus on the level of physical
66 activity amongst staff in the workplaces who are likely being overlooked (Jackson et al., 2014).
67 However, despite of the suggestion, only a few studies have focused on students and employees
68 within the higher education sector, especially the college or university (Safi et al., 2021). Most
69 of the previous research mainly focused on PA levels of one specific university member and
70 classified them as a homogeneous group. Whereas, due to the cultural differences across
71 departments or majors, it is essential to know that a university has a diverse range of members
72 or communities with its own characteristics. Therefore, this study was conducted to measure
73 and evaluate the current level of physical activity amongst the university community.

74 **Materials and methods**

75 *Study participants*

76 This study used a cross-sectional design with 2698 university students and 355 lecturers across
77 seven faculties, one postgraduate program, and one vocational program at Universitas Negeri
78 Surabaya involved as participants. Study inclusion criteria common to both samples included:
79 (1) current enrolment as an active undergraduate student or an active lecturer at the university,
80 based on data retrieved from Republic of Indonesia's Higher Education Database (PDDIKTI);
81 (2) completing a self-administered questionnaire comprised of a number of measures during
82 November 2021.

83 *Study organization*

84 The online survey comprised of two sections which assessed subjective
85 characteristics of participants and a structured questionnaire modified from the
86 WHO Global Physical Activity Questionnaire (GPAQ) that has been translated
87 into Indonesian, to measure the level of physical activity. Respondents were
88 asked to report the number of days and duration of activities spent on studying or
89 working, transporting, and leisure or recreational activities, comprising of 16
90 items in total and 1 question on sedentary behaviour. Participants were excluded
91 if data pertaining to each item of GPAQ was not reported. MET-minutes/week
92 METs or Metabolic Equivalents were used to express the intensity of physical
93 activity and were also used for the analysis of the GPAQ data. The level of PA
94
95

was then classified into three categories: (a) low PA (METs value less than 600); (b) moderate PA (METs value 600 – 3000); and (c) high PA (METs value more than 3000) (Uddin et al., 2017).

Statistical analysis

All statistical tests were carried out using SPSS 21 for Windows. The standard univariate statistic was used to describe the study population; means and standard deviation were used for continuous variables, while frequency and percentage were used for categorical variables. The difference in the characteristic of participants was analysed using Chi-Square. Mann-Whitney test was conducted to determine the difference in and the level of physical activity between students and lecturers. In all instances, the level of significance was set at $p < 0.05$.

Results

This research aimed to measure the level of physical activity of lecturers and university students across majors and programs. Most of the student participants were female (71.39%) with average bodyweight, height, and BMI was 54.65 ± 11.00 kg, 159.25 ± 7.00 cm, and 22.08 ± 5.55 kg/m², respectively. While the majority of lecturer participants comprised of male (52.68%), with an average of age was 48.99 ± 102.28 years and had higher bodyweight (69.25 ± 15.74 kg), height (161.55 ± 13.14 cm), as well as BMI (34.52 ± 5.38 kg/m²) compared to the students. In terms of BMI, most of the students had normal BMI (58.82%), while almost half of the lecturers had BMI in the overweight category (42.82%). Both students and lecturers in all majors and programs did physical activity at least once a week, did not smoke, had a moderate level of PA, and only a few of them had NCD's comorbid (Table 1).

Table 1. Socio-demography characteristic of study participants

Characteristics	Student	Lecturer	P (sig)
Gender (n, %)			
Male	772 (28.61)	187 (52.68)	0.214
Female	1926 (71.39)	168 (47.32)	

Characteristics	Student	Lecturer	P (sig)
Age (year; mean \pm SD)	20.41 \pm 3.41	48.99 \pm 102.28	0.001*
Bodyweight (kg; mean \pm SD)	54.65 \pm 11.00	69.25 \pm 15.74	0.023*
Height (cm; mean \pm SD)	159.25 \pm 7.00	161.55 \pm 13.14	0.156
Body mass index (BMI) (kg/m ² ; mean \pm SD)	22.08 \pm 5.55	34.52 \pm 5.38	0.015*
BMI category (n, %)			
Underweight	588 (21.79)	9 (2.54)	0.412
Normal	1587 (58.82)	147 (41.41)	
Overweight	383 (14.20)	152 (42.82)	
Obese	140 (5.19)	47 (13.24)	
Frequency of PA (n, %)			
Never	456 (16.90)	43 (12.11)	0.047**
Once a week	1036 (38.40)	117 (32.96)	
Twice a week	520 (19.27)	73 (20.56)	
Three times a week	331 (12.27)	60 (16.90)	
Almost everyday	255 (13.16)	62 (17.46)	
Levels of PA (n, %)			
Low	1109 (41.10)	132 (37.18)	0.360
Moderate	1214 (45.00)	185 (52.11)	
Vigorous	375 (13.90)	38 (10.70)	
METs (min/week, mean \pm SD)	1612.81 \pm 542.21	1178.0 \pm 694.54	0.011*
Smoking status (n, %)			
Yes	965 (35.77)	95 (26.76)	0.214
No	1733 (64.23)	260 (73.24)	
Present of NCD (n, %)			
Hypertension	49 (1.82)	23 (6.48)	0.335
Hypotension	196 (7.26)	11 (3.10)	
Asthma	83 (3.08)	5 (1.41)	
Diabetes mellitus type II	25 (0.93)	7 (1.97)	
Vision disorder	99 (3.67)	16 (4.51)	
Osteoporosis	10 (0.37)	40 (11.27)	
Others	481 (17.83)	45 (12.68)	
None	1755 (65.05)	208 (58.59)	

*significantly different using Mann Whitney (p<0.05)

**significantly different using Chi-Square test (p<0.05)

Mann Whitney test shows that age (p = 0.001), bodyweight (p = 0.023), body mass index (p = 0.015), and METs score (p = 0.011) were significantly different between students and lecturers. Analysis of categorical data using the Chi-Square test shows that only the frequency of physical activity in a week differs statistically (p = 0.047).

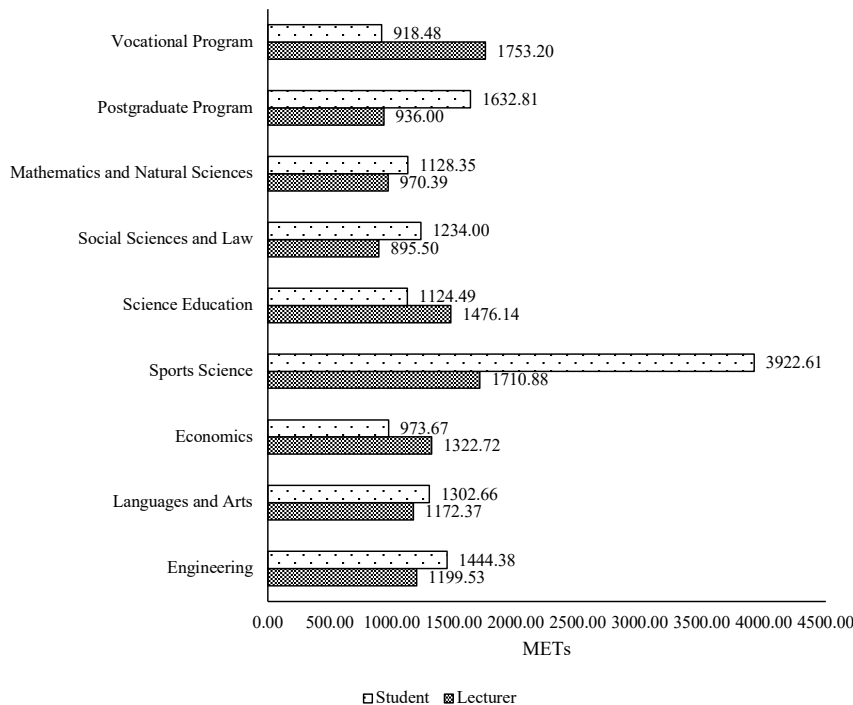


Figure 1. The results of the MET scores of lecturers and students across different majors and programs

The MET values of lecturers and students across different majors and study programs based on the results of the GPAQ questionnaire. Students from the Sports Science major had the highest METs scores, 3922.61 minutes/week and students from Vocational programs had the lowest level of METs (918.48 minutes/week). Meanwhile, the lecturers obtained the highest and lowest MET scores from Vocational programs and Social Sciences and Law majors with a score of 1753.20 and 895.50 minutes/week. Furthermore, to determine the difference between the METs scores of lecturers and students in each major and program, a different test was carried out using the Mann Whitney as the data was not normally distributed (Figure 1).

Table 2. Differences in METs between lecturers and students across majors/programs

Major / Program	n	Mean \pm SD	P (sig)
Engineering	Lecturer = 58	1199.53 \pm 1531.37	0.946

Major / Program	n	Mean \pm SD	P (sig)
Languages and Arts	Student = 436	1444.38 \pm 2002.68	0.757
	Lecturer = 50	1172.37 \pm 1308.26	
	Student = 289	1302.66 \pm 1833.73	
Economics	Lecturer = 43	1322.72 \pm 1345.29	0.023*
	Student = 195	973.69 \pm 1318.17	
Sports Science	Lecturer = 53	1710.88 \pm 1474.63	0.000*
	Student = 292	3922.61 \pm 3594.54	
Education	Lecturer = 65	1476.14 \pm 1640.34	0.011*
	Student = 861	1124.49 \pm 1606.07	
Social Sciences and Law	Lecturer = 24	895.50 \pm 721.08	0.714
	Student = 227	1234.00 \pm 2393.47	
Mathematics and Natural Sciences	Lecturer = 42	970.39 \pm 969.84	0.977
	Student = 189	1128.35 \pm 1307.38	
Postgraduate Program	Lecturer = 5	936.00 \pm 545.97	0.836
	Student = 87	1632.81 \pm 2072.53	
Vocational Program	Lecturer = 15	918.48 \pm 1234.13	0.082
	Student = 122	1753.20 \pm 2197.25	

*significantly different using the Mann Whitney test ($p < 0.05$)

Table 2 presents there was a significant difference in the METs scores between lecturers and students in three majors, which were Economics, Sports Science, and Science Education ($p < 0.05$). The percentage of physical activity level category was then calculated based on the METs values. The results are presented in the figure below.

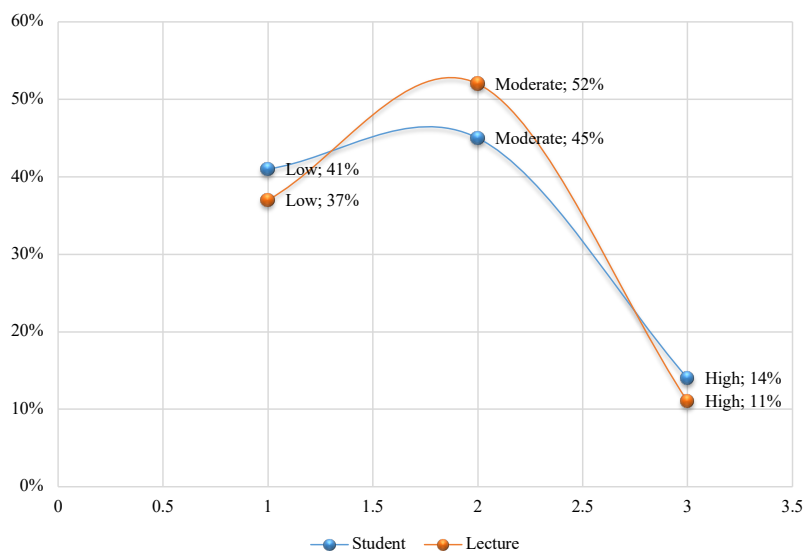


Figure 2. The physical activity level of students and lecturer

The majority of respondents had moderate physical activity levels with a percentage of 45.0% for students and 52% for lecturers. The second-largest percentage is in the low category for both lecturers and students. Then the smallest percentage is in the high category for both the lecturers and students. It shows that the academic community's overall physical activity tends to be at a moderate level, as seen from the percentage of categories (Figure 2).

Discussion

There is a lack of research that comprehensively assesses the PA levels for students and lecturers in all majors and programs at the University, especially in Indonesia. Identifying particular populations such as students and lecturers is very interesting because they are a specific and busy population with a regular timetable who spend most of their time studying and teaching for lecturers during their weekdays (Arias-Palencia et al., 2015). This present study has several noteworthy findings that could be highlighted. In general, the level of physical activity of students and lecturers was mainly in the moderate category. However, the category of low physical activity level was also in high percentage. These findings showed that the level of physical activity of all participants in general still tends to be low. Low physical activity is a major risk factor for many adverse health conditions (Lee, Shiroma, Lobelo, Puska, Blair, & Katzmarzyk, 2012), especially the world's major non-communicable diseases, and has a negative effect on the quality of life and mental health (Guthold et al., 2018). Physical activity is one way to prevent and reduce the risk of non-communicable diseases such as obesity (Ekelund et al., 2016), which is the prevalence continues to increase due to changing lifestyles with technological advances and the increasingly widespread use of machines, thereby reducing a person's physical activity (Peyman et al., 2018; Safi et al., 2021).

173 In conformity with the METs scores obtained from the participants, students of the Sports
174 Science major got the highest average METs scores. This is also conformable with findings
175 reported by Alkatan et al., (2021) which is shown that the PA level among physical education
176 college students in Kuwait was relatively high. It is due to the lecture process, students are
177 taught to exercise and do physical activities. They demonstrate the lecture material by doing
178 sports activities so that their physical activity is high enough to have an average MET of
179 3922.61 minutes per week. Besides, many Sports Science students are collegiate student-
180 athletes who are still active or former athletes who joined many sports clubs. Hence, their
181 participation in sports activities is greater than their peers in other majors' (Gayles & Hu, 2009).
182 Additionally, during the learning activities, both lecturers and students of Sports Science are
183 mainly involved in discussions or interactive dialogues about the importance of sports, physical
184 activity, and a healthy lifestyle. Therefore, Sport Science students tend to have better sports
185 literacy and physical activity (Bulqini et al., 2021). With good physical literacy, students will
186 have the results of motor skills, environmental context, and a broader affective social learning
187 process. Students who receive physical education-related courses at college or university are
188 more likely to exhibit positive social life perceptions and have a better-coping stress
189 mechanism (Beaudoin et al., 2018; Choi et al., 2021). Good physical and health literacy also
190 plays a role in positive health behaviours (Cairney et al., 2019; Klinker et al., 2020; Park et al.,
191 2017; Zhang et al., 2021), as stated by a previous study that health literacy enables people to
192 build their knowledge, skills, and potential to make positive behavioural changes. Improving
193 health literacy is more likely to lead to sustainable behaviour change given that lower levels of
194 health literacy are associated with poorer health outcomes (Visscher et al., 2018) and academic
195 performance (Bulqini et al., 2021).
196 Based on the findings, lecturers' METs scores tend to be lower than students' (see Table 1 and
197 Figure 1). One of many possible reasons that could explain this finding was related to age. Sun

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198 et al (2013) stated in their research that older people tend to have lower levels of physical
 199 activity than young people. While the lecturers may be more knowledgeable about the health
 200 benefits of physical activity, it does not mean that their knowledge will always equate to action.
 201 Time availability, fatigue, motivation, and the increased use of technology are some of the
 202 barriers applicable to this population (Whipple et al., 2008). Time availability that lecturers
 203 specifically allocate to their works appears to cause a major impact upon the declining
 204 engagement of physical activity on a daily basis (da Silva et al., 2018). It was reiterated by
 205 other studies which reported that adults across workplaces spent as much as 60% - 70% of their
 206 waking time to work, with more than 75% of it being sedentary (Edge et al., 2017; Headley et
 207 al., 2018; Thivel et al., 2018; Waters et al., 2016), which is most of their time is engaged in
 208 prolonged sitting (Mustar et al., 2021). Several cross-sectional studies reported that the increase
 209 in sedentary activity at work was linked to lower productivity (Puig-Ribera et al., 2015) and
 210 fatigue (Rosenkranz et al., 2020). Therefore, it is suggested that the university should
 211 implement appropriate interventions to increase physical activity, especially for the lecturers
 212 and staff, to ensure they are provided with opportunities to stay active during working hours
 213 (Safi et al., 2021) and increase their work performance.
 214 Being an academic includes a busy work schedule and a long duration of scientific activities.
 215 Because of this, lecturers are pushed into being more physically inactive and spend more time
 216 on sitting (Cinar & Bavli, 2014). Nevertheless, the present study found that the lecturers
 217 working in the Vocational and Sport Science program had the highest METs score. There is a
 218 need for more studies to discuss this finding, but some explanations that may elucidate this
 219 finding is are that Vocational and Sport Science programs comprise more practical teaching
 220 that urges both lecturers and students to actively move rather than just sit. It is in agreement
 221 with a previous study which indicated that teachers who teach practical courses or lectures tend
 222 to be more physically active and spend more time doing leisure physical activity compared to

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other peers (Bogaert et al., 2014; Erick & Smith, 2011). However, a more detailed analysis regarding the relationship between physical activity level and teaching subject area is needed to confirm this finding.

Despite revealing the results that impact physical activity levels in both lecturers and students, this present study has some limitations that can be highlighted. First, the data collected through GPAQ and self-reported methods are prone to human error, such as overestimating or vice versa. Nonetheless, this can be prevented by using tools to monitor PA, such as accelerometers, so that the results obtained can be more accurate. Second, the limitation of this study included the use of a convenience sample that was limited to only students and lecturers who filled out the questionnaire. Geographic location and the lack of variability of the socio-demographic factors would also limit the ability to generalize the findings to other populations.

Conclusions

Most of the students and lecturers had a low level of PA, with the highest METs was found in students coming from Sport Science majors and lecturers working in Vocational programs. Findings from this study led as the reference in developed strategies and policies aimed at promoting and improving physical activity and the welfare of the university community. Furthermore, the university needs to advocate and motivate the academic community to increase awareness of a healthy lifestyle, mainly engaging in light physical activity during working days to maintain health, fitness, well-being, and quality of life. Additional population-based studies, preferably longitudinal studies with representative samples from state and private universities and objective measurement of physical activity, are needed to understand the factors associated with physical activity in the university community, particularly among students and lecturers who spent most of their time with students and lecturers at university.

Acknowledgment

The authors would like to thank all the volunteers for their contribution to participate in this study, including Pusat Kajian Ilmu Keolahragaan (PKIK) Universitas Negeri Surabaya for assisting in data collection.

Conflict of interest

No conflict of interest to declare.

References

- Acebes-Sánchez, J., Diez-Vega, I., & Rodriguez-Romo, G. (2019). Physical activity among spanish undergraduate students: A descriptive correlational study. *International Journal of Environmental Research and Public Health*, 16(15), 2770. <https://doi.org/10.3390/ijerph16152770>
- Alkatan, M., Alsharji, K., Akbar, A., Alshareefi, A., Alkhalaf, S., Alabduljader, K., & Al-Hazzaa, H. M. (2021). Physical activity and sedentary behaviors among active college students in Kuwait relative to gender status. *Journal of Preventive Medicine and Hygiene*, 62(2), E407–E414. <https://doi.org/10.15167/2421-4248/jpmh2021.62.2.1650>
- Alkhateeb, S. A., Alkhameesi, N. F., Lamfon, G. N., Khawandanh, S. Z., Kurdi, L. K., Faran, M. Y., Khoja, A. A., Bukhari, L. M., Aljahdali, H. R., Ashour, N. A., Bagasi, H. T., Delli, R. A., Khoja, O. A., & Safdar, O. Y. (2019). Pattern of physical exercise practice among university students in the Kingdom of Saudi Arabia (before beginning and during college): A cross-sectional study. *BMC Public Health*, 19(1), 1716. <https://doi.org/10.1186/s12889-019-8093-2>
- Anderson, E., & Durstine, J. L. (2019). Physical activity, exercise, and chronic diseases: A brief review. *Sports Medicine and Health Science*, 1(1), 3–10. <https://doi.org/10.1016/j.smhs.2019.08.006>
- Arias-Palencia, N. M., Solera-Martínez, M., Gracia-Marco, L., Silva, P., Martínez-Vizcaino, V., Cañete-García-Prieto, J., & Sánchez-López, M. (2015). Levels and Patterns of Objectively Assessed Physical Activity and Compliance with Different Public Health Guidelines in University Students. *PLOS ONE*, 10(11), e0141977. <https://doi.org/10.1371/journal.pone.0141977>

274 Beaudoin, C., Parker, T., Tiemersma, K., & Lewis, C. (2018). Evaluating university physical
 275 activity courses from student and instructor perspectives. *Journal of Physical Education,
 276 Recreation & Dance*, 89(1), 7–11. <https://doi.org/10.1080/07303084.2017.1390508>

277 Bogaert, I., De Martelaer, K., Deforche, B., Clarys, P., & Zinzen, E. (2014). Associations
 278 between different types of physical activity and teachers' perceived mental, physical, and
 279 work-related health. *BMC Public Health*, 14(1), 534. <https://doi.org/10.1186/1471-2458-14-534>

280 534

281 Brown, T. C., Volberding, J., Baghurst, T., & Sellers, J. (2014). Faculty/staff perceptions of a
 282 free campus fitness facility. *International Journal of Workplace Health Management*, 7(3),
 283 156–170. <https://doi.org/10.1108/IJWHM-05-2013-0020>

284 Bulqini, A., Sholikhah, A. M., Ridwan, M., & Prakoso, B. B. (2021). Impact of health-related
 285 lifestyle (HRL) factors on student academic achievement. *DEGRES*, 20(1), Article 1.
 286 <https://doi.org/10.1877/degres.v20i1.61>

287 Cairney, J., Dudley, D., Kwan, M., Bulten, R., & Kriellaars, D. (2019). Physical literacy,
 288 physical activity and health: Toward an evidence-informed conceptual model. *Sports Medicine
 289 (Auckland, N.Z.)*, 49(3), 371–383. <https://doi.org/10.1007/s40279-019-01063-3>

290 Caletine, J., Bopp, M., Bopp, C. M., & Papalia, Z. (2017). College student work habits are
 291 related to physical activity and fitness. *International Journal of Exercise Science*, 10(7), 1009–
 292 1017.

293 Choi, S. M., Sum, K. W. R., Leung, F. L. E., Ha, S. C. A., Sit, C., & Yeung, K. H. (2021).
 294 Predictors of physical activity levels in university physical education implementing sport
 295 education. *Journal of Sports Science & Medicine*, 20(3), 516.
 296 <https://doi.org/10.52082/jssm.2021.516>

297 Chu, A. H. Y., Koh, D., Moy, F. M., & Müller-Riemenschneider, F. (2014). Do workplace
 298 physical activity interventions improve mental health outcomes? *Occupational Medicine
 299 (Oxford, England)*, 64(4), 235–245. <https://doi.org/10.1093/occmed/kqu045>

300 Cinar, S., & Bavli, Ö. (2014). Investigation the physical activity level of academics: Çanakkale
 301 sample. *Türk Spor ve Egzersiz Dergisi*, 16(3), Article 3.

302 da Silva, I. C. M., Mielke, G. I., Bertoldi, A. D., Arrais, P. S. D., Luiza, V. L., Mengue, S. S.,
 303 & Hallal, P. C. (2018). Overall and leisure-time physical activity among brazilian adults:
 304 National survey based on the global physical activity questionnaire. *Journal of Physical
 305 Activity & Health*, 15(3), 212–218. <https://doi.org/10.1123/jpah.2017-0262>

306 Edge, C. E., Cooper, A. M., & Coffey, M. (2017). Barriers and facilitators to extended working
307 lives in Europe: A gender focus. *Public Health Reviews*, 38(1), 2.
308 <https://doi.org/10.1186/s40985-017-0053-8>

309 Edmunds, S., Hurst, L., & Harvey, K. (2013). Physical activity barriers in the workplace: An
310 exploration of factors contributing to non-participation in a UK workplace physical activity
311 intervention. *International Journal of Workplace Health Management*, 6(3), Article 3.
312 <https://doi.org/10.1108/IJWHM-11-2010-0040>

313 Ekelund, U., Steene-Johannessen, J., Brown, W. J., Fagerland, M. W., Owen, N., Powell, K.
314 E., Bauman, A., & Lee, I.-M. (2016). Does physical activity attenuate, or even eliminate, the
315 detrimental association of sitting time with mortality? A harmonised meta-analysis of data from
316 more than 1 million men and women. *The Lancet*, 388(10051), 1302–1310.
317 [https://doi.org/10.1016/S0140-6736\(16\)30370-1](https://doi.org/10.1016/S0140-6736(16)30370-1)

318 Elmagd, M. A. (2016). Benefits, need and importance of daily exercise. *International Journal*
319 *of Physical Education, Sports and Health*, 3(5), 22–27.

320 Erick, P. N., & Smith, D. R. (2011). A systematic review of musculoskeletal disorders among
321 school teachers. *BMC Musculoskeletal Disorders*, 12, 260. [https://doi.org/10.1186/1471-2474-](https://doi.org/10.1186/1471-2474-12-260)
322 12-260

323 Fountaine, C. J., Piacentini, M., & Liguori, G. (2014). Occupational sitting and physical
324 activity among university employees. *International Journal of Exercise Science*, 7(4), 295–
325 201.

326 Gayles, J. G., & Hu, S. (2009). The influence of student engagement and sport participation on
327 college outcomes among division I student athletes. *The Journal of Higher Education*, 80(3),
328 315–333.

329 Guthold, R., Stevens, G. A., Riley, L. M., & Bull, F. C. (2018). Worldwide trends in insufficient
330 physical activity from 2001 to 2016: A pooled analysis of 358 population-based surveys with
331 1·9 million participants. *The Lancet Global Health*, 6(10), e1077–e1086.
332 [https://doi.org/10.1016/S2214-109X\(18\)30357-7](https://doi.org/10.1016/S2214-109X(18)30357-7)

333 Guthold, R., Stevens, G. A., Riley, L. M., & Bull, F. C. (2020). Global trends in insufficient
334 physical activity among adolescents: A pooled analysis of 298 population-based surveys with
335 1·6 million participants. *The Lancet Child & Adolescent Health*, 4(1), 23–35.
336 [https://doi.org/10.1016/S2352-4642\(19\)30323-2](https://doi.org/10.1016/S2352-4642(19)30323-2)

337 Harvey, S. B., Øverland, S., Hatch, S. L., Wessely, S., Mykletun, A., & Hotopf, M. (2018).
338 Exercise and the Prevention of Depression: Results of the HUNT Cohort Study. *The American*
339 *Journal of Psychiatry*, 175(1), 28–36. <https://doi.org/10.1176/appi.ajp.2017.16111223>

340 Headley, S., Hutchinson, J., Wooley, S., Dempsey, K., Phan, K., Spicer, G., Janssen, X.,
 341 Laguilles, J., & Matthews, T. (2018). Subjective and objective assessment of sedentary
 342 behavior among college employees. *BMC Public Health*, 18(1), 768.
 343 <https://doi.org/10.1186/s12889-018-5630-3>
 344 Hermassi, S., Hayes, L. D., Salman, A., Sanal-Hayes, N. E. M., Abassi, E., Al-Kuwari, L.,
 345 Aldous, N., Musa, N., Alyafei, A., Bouhafs, E. G., & Schwesig, R. (2021). Physical Activity,
 346 Sedentary Behavior, and Satisfaction With Life of University Students in Qatar: Changes
 347 During Confinement Due to the COVID-19 Pandemic. *Frontiers in Psychology*, 12.
 348 <https://www.frontiersin.org/articles/10.3389/fpsyg.2021.704562>
 349 Jackson, C., Lewis, K., Conner, M., Lawton, R., & R.C. McEachan, R. (2014). Are incremental
 350 changes in physical activity and sedentary behaviours associated with improved employee
 351 health?: A 12-month prospective study in five organisations. *International Journal of*
 352 *Workplace Health Management*, 7(1), 16–39. <https://doi.org/10.1108/IJWHM-03-2013-0013>
 353 Joseph, R. P., Ainsworth, B. E., Keller, C., & Dodgson, J. E. (2015). Barriers to physical
 354 activity among african american women: An integrative review of the literature. *Women &*
 355 *Health*, 55(6), 679–699. <https://doi.org/10.1080/03630242.2015.1039184>
 356 Kim, Y. S., Park, Y. S., Allegrante, J. P., Marks, R., Ok, H., Ok Cho, K., & Garber, C. E.
 357 (2012). Relationship between physical activity and general mental health. *Preventive Medicine*,
 358 55(5), 458–463. <https://doi.org/10.1016/j.ypmed.2012.08.021>
 359 Klinker, C. D., Aaby, A., Ringgaard, L. W., Hjort, A. V., Hawkins, M., & Maindal, H. T.
 360 (2020). Health Literacy is Associated with Health Behaviors in Students from Vocational
 361 Education and Training Schools: A Danish Population-Based Survey. *International Journal of*
 362 *Environmental Research and Public Health*, 17(2), 671.
 363 <https://doi.org/10.3390/ijerph17020671>
 364 Kljajević, V., Stanković, M., Đorđević, D., Trkulja-Petković, D., Jovanović, R., Plazibat, K.,
 365 Oršolić, M., Čurić, M., & Sporiš, G. (2022). Physical activity and physical fitness among
 366 university students—A systematic review. *International Journal of Environmental Research*
 367 *and Public Health*, 19(1), Article 1. <https://doi.org/10.3390/ijerph19010158>
 368 Lee, I.-M., Shiroma, E. J., Lobelo, F., Puska, P., Blair, S. N., & Katzmarzyk, P. T. (2012).
 369 Impact of physical inactivity on the world's major non-communicable diseases. *Lancet*,
 370 380(9838), 219–229. [https://doi.org/10.1016/S0140-6736\(12\)61031-9](https://doi.org/10.1016/S0140-6736(12)61031-9)
 371 Lee, I.-M., Shiroma, E. J., Lobelo, F., Puska, P., Blair, S. N., Katzmarzyk, P. T., & Lancet
 372 Physical Activity Series Working Group. (2012). Effect of physical inactivity on major non-
 373 communicable diseases worldwide: An analysis of burden of disease and life expectancy.

374 *Lancet* (London, England), 380(9838), 219–229. <https://doi.org/10.1016/S0140->
 375 6736(12)61031-9
 376 Legido-Quigley, H., Mateos-García, J. T., Campos, V. R., Gea-Sánchez, M., Muntaner, C., &
 377 McKee, M. (2020). The resilience of the Spanish health system against the COVID-19
 378 pandemic. *The Lancet Public Health*, 5(5), e251–e252. <https://doi.org/10.1016/S2468->
 379 2667(20)30060-8
 380 Mathers, C. D. (2020). History of global burden of disease assessment at the World Health
 381 Organization. *Archives of Public Health*, 78(1), 77. <https://doi.org/10.1186/s13690-020->
 382 00458-3
 383 Moore, S. C., Lee, I.-M., Weiderpass, E., Campbell, P. T., Sampson, J. N., Kitahara, C. M.,
 384 Keadle, S. K., Arem, H., Berrington de Gonzalez, A., Hartge, P., Adami, H.-O., Blair, C. K.,
 385 Borch, K. B., Boyd, E., Check, D. P., Fournier, A., Freedman, N. D., Gunter, M., Johansson,
 386 M., ... Patel, A. V. (2016). Association of Leisure-Time Physical Activity With Risk of 26
 387 Types of Cancer in 1.44 Million Adults. *JAMA Internal Medicine*, 176(6), 816–825.
 388 <https://doi.org/10.1001/jamainternmed.2016.1548>
 389 Mustar, Y. S., Nissa, F. A. K., Hariyanto, A., Pramono, B. A., & Susanto, I. H. (2021). *Self-*
 390 *Reported Assessment of Occupational Sitting and Physical Activity Among Employees*. 438–
 391 444. <https://doi.org/10.2991/assehr.k.211223.076>
 392 Park, A., Eckert, T. L., Zaso, M. J., Scott-Sheldon, L. A. J., Venable, P. A., Carey, K. B., Ewart,
 393 C. K., & Carey, M. P. (2017). Associations between Health Literacy and Health Behaviors
 394 among Urban High Schoolers. *The Journal of School Health*, 87(12), 885–893.
 395 <https://doi.org/10.1111/josh.12567>
 396 Pengpid, S., & Peltzer, K. (2021). Prevalence and correlates of multiple behavioural risk factors
 397 of non-communicable diseases among university students from 24 countries. *Journal of Public*
 398 *Health*, 43(4), 857–866. <https://doi.org/10.1093/pubmed/fdaa138>
 399 Peyman, N., Rezai-Rad, M., Tehrani, H., Gholian-Aval, M., Vahedian-Shahroodi, M., &
 400 Heidarian Miri, H. (2018). Digital media-based health intervention on the promotion of
 401 women's physical activity: A quasi-experimental study. *BMC Public Health*, 18(1), 134.
 402 <https://doi.org/10.1186/s12889-018-5025-5>
 403 Puig-Ribera, A., Martínez-Lemos, I., Giné-Garriga, M., González-Suárez, Á. M., Bort-Roig,
 404 J., Fortuño, J., Muñoz-Ortiz, L., McKenna, J., & Gilson, N. D. (2015). Self-reported sitting
 405 time and physical activity: Interactive associations with mental well-being and productivity in
 406 office employees. *BMC Public Health*, 15, 72. <https://doi.org/10.1186/s12889-015-1447-5>

407 Rajappan, R., Selvaganapathy, K., & Liew, L. (2015). Physical activity level among university
 408 students: A cross sectional survey. *International Journal of Physiotherapy and Research*, 3(6),
 409 1336–1343. <https://doi.org/10.16965/ijpr.2015.202>
 410 Rodríguez-Fernández, A., & Ramos-Díaz, A. Z.-R.-B. and E. (2017). Quality of life and
 411 physical activity: Their relationship with physical and psychological well-being. In *Quality of*
 412 *Life and Quality of Working Life*. IntechOpen. <https://doi.org/10.5772/intechopen.69151>
 413 Romero-Blanco, C., Rodríguez-Almagro, J., Onieva-Zafra, M. D., Parra-Fernández, M. L.,
 414 Prado-Laguna, M. del C., & Hernández-Martínez, A. (2020). Physical activity and sedentary
 415 lifestyle in university students: Changes during confinement due to the covid-19 pandemic.
 416 *International Journal of Environmental Research and Public Health*, 17(18), 6567.
 417 <https://doi.org/10.3390/ijerph17186567>
 418 Rosenkranz, S. K., Mailey, E. L., Umansky, E., Rosenkranz, R. R., & Ablah, E. (2020).
 419 Workplace sedentary behavior and productivity: A cross-sectional study. *International Journal*
 420 *of Environmental Research and Public Health*, 17(18), E6535.
 421 <https://doi.org/10.3390/ijerph17186535>
 422 Runacres, A., Mackintosh, K. A., Knight, R. L., Sheeran, L., Thatcher, R., Shelley, J., &
 423 McNarry, M. A. (2021). Impact of the COVID-19 Pandemic on Sedentary Time and Behaviour
 424 in Children and Adults: A Systematic Review and Meta-Analysis. *International Journal of*
 425 *Environmental Research and Public Health*, 18(21), 11286.
 426 <https://doi.org/10.3390/ijerph182111286>
 427 Safi, A., Cole, M., Kelly, A. L., & Walker, N. C. (2021). An evaluation of physical activity
 428 levels amongst university employees. *Advances in Physical Education*, 11(2), Article 2.
 429 <https://doi.org/10.4236/ape.2021.112012>
 430 Saqib, Z. A., Dai, J., Menhas, R., Mahmood, S., Karim, M., Sang, X., & Weng, Y. (2020).
 431 Physical Activity is a Medicine for Non-Communicable Diseases: A Survey Study Regarding
 432 the Perception of Physical Activity Impact on Health Wellbeing. *Risk Management and*
 433 *Healthcare Policy*, 13, 2949–2962. <https://doi.org/10.2147/RMHP.S280339>
 434 Sun, F., Norman, I. J., & While, A. E. (2013). Physical activity in older people: A systematic
 435 review. *BMC Public Health*, 13(1), 449. <https://doi.org/10.1186/1471-2458-13-449>
 436 Thivel, D., Tremblay, A., Genin, P. M., Panahi, S., Rivière, D., & Duclos, M. (2018). Physical
 437 Activity, Inactivity, and Sedentary Behaviors: Definitions and Implications in Occupational
 438 Health. *Frontiers in Public Health*, 6, 288. <https://doi.org/10.3389/fpubh.2018.00288>

439 Uddin, R., Khan, A., & Burton, N. W. (2017). Prevalence and sociodemographic patterns of
 440 physical activity among Bangladeshi young adults. *Journal of Health, Population and*
 441 *Nutrition*, 36(1), 31. <https://doi.org/10.1186/s41043-017-0108-y>

442 Van Dyck, D., Cerin, E., De Bourdeaudhuij, I., Hinckson, E., Reis, R. S., Davey, R., Sarmiento,
 443 O. L., Mitas, J., Troelsen, J., MacFarlane, D., Salvo, D., Aguinaga-Ontoso, I., Owen, N., Cain,
 444 K. L., & Sallis, J. F. (2015). International study of objectively measured physical activity and
 445 sedentary time with body mass index and obesity: IPEN adult study. *International Journal of*
 446 *Obesity* (2005), 39(2), 199–207. <https://doi.org/10.1038/ijo.2014.115>

447 Visscher, B. B., Steunenbergh, B., Heijmans, M., Hofstede, J. M., Devillé, W., van der Heide,
 448 I., & Rademakers, J. (2018). Evidence on the effectiveness of health literacy interventions in
 449 the EU: A systematic review. *BMC Public Health*, 18(1), 1414.
 450 <https://doi.org/10.1186/s12889-018-6331-7>

451 Waters, C. N., Ling, E. P., Chu, A. H. Y., Ng, S. H. X., Chia, A., Lim, Y. W., & Müller-
 452 Riemenschneider, F. (2016). Assessing and understanding sedentary behaviour in office-based
 453 working adults: A mixed-method approach. *BMC Public Health*, 16(1), 360.
 454 <https://doi.org/10.1186/s12889-016-3023-z>

455 Whipple, K., Kinney, J., & Kattenbraker, M. (2008). Maintenance of physical activity among
 456 faculty and staff in university settings. *Health Educator*, 40(1), 21–28.

457 WHO. (2009). *Global health risks: Mortality and burden of disease attributable to selected*
 458 *major risks*. World Health Organization. <https://apps.who.int/iris/handle/10665/44203>

459 WHO. (2020). *WHO Guideline on Physical Activity and Sedentary Behaviour*. World Health
 460 Organization. [https://apps.who.int/iris/bitstream/handle/10665/337001/9789240014886-](https://apps.who.int/iris/bitstream/handle/10665/337001/9789240014886-eng.pdf)
 461 [eng.pdf](https://apps.who.int/iris/bitstream/handle/10665/337001/9789240014886-eng.pdf)

462 Zhang, F., Or, P. P. L., & Chung, J. W. Y. (2021). How different health literacy dimensions
 463 influences health and well-being among men and women: The mediating role of health
 464 behaviours. *Health Expectations : An International Journal of Public Participation in Health*
 465 *Care and Health Policy*, 24(2), 617–627. <https://doi.org/10.1111/hex.13208>

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REVISION ARTICLE

Physical Activity Level Amongst University Students and Lecturers Across Majors and Programs in Indonesia

Abstract

Background. Physical inactivity is the fourth leading risk factor contributing to the rapid increase in global mortality. The number is increasing in all sectors, with higher education institutions no exception. With university lecturers and students' issues related to health and well-being are becoming more prevalent, the need to engage more time in doing physical activity becomes more important.

The purpose of this study is to estimate the current physical activity level of students and lecturers across faculties and majors.

Materials and methods. A cross-sectional study was conducted among 2698 students and 355 lecturers in November 2021. They completed an online Global Physical Activity Questionnaire (GPAQ) and reported the number of days and duration of activities they spent studying or working, travelling, and recreational activities. All responses to the duration were converted from hours into METs. Statistical analysis and data entry was performed using SPSS version 21.

Results. A significant difference was found in METs scores between lecturers and students in three majors: Economics, Sports Science, and Science Education ($p < 0.05$). Other findings showed that the PA level among students and lecturers were found in the moderate category, although the low level of physical activity was also higher. Lack of physical activity is a major risk factor for non-communicable diseases and has a negative effect on the quality of life and mental health.

Conclusions. Therefore, the university needs to carefully design policies and strategies to promote and enhance the physical activity and well-being of students, lecturers, staff, and all people involved.

29 **Keywords:** physical fitness, METs, lecturer, student, college.

30 **Introduction**

31 Previous studies have well-documented numerous health benefits of
32 physical activity (PA) and exercise, with participation in moderate-intensity of
33 physical activity on a daily basis is proved to enhance both the physical (Lee,
34 Shiroma, Lobelo, Puska, Blair, Katzmarzyk, et al., 2012) and mental health (Chu
35 et al., 2014; Kim et al., 2012), besides maintaining fitness level to improve quality
36 of life (Rodríguez-Fernández & Ramos-Díaz, 2017). It is reiterated with a study
37 conducted by Elmagd (2016), which states that physical activity and exercise can
38 reduce anxiety and stress, increase self-confidence, sharpen brain memory and
39 increase muscle and bone strength. Regular physical activity is also found to
40 lower the risk of non-communicable diseases such as type 2 diabetes,
41 cardiovascular diseases, musculoskeletal disorders, prevent depression, and
42 cancers (Anderson & Durstine, 2019; Harvey et al., 2018; Moore et al., 2016;
43 Safi et al., 2021). Despite the many positive impacts of physical activity, nearly
44 60% of the world's population fails to meet the recommended duration (Guthold
45 et al., 2020; Rajappan et al., 2015; Van Dyck et al., 2015), which is accumulated
46 at least 150 minutes of moderate to vigorous PA (MVPA) every week as
47 suggested by WHO (2020). Inadequate physical activity contributes to the rapid-
48 growing proportion of chronic diseases (WHO, 2009), which account for almost
49 half the total global burden of diseases (Mathers, 2020).

50 There is notable evidence reported the decreased participation in physical
51 activity through adolescence, and this trend continues with the increase of age
52 throughout adulthood (Calestine et al., 2017). In the university setting, the
53 number of people who did not participate in regular physical activity was also
54 seen to rise (Calestine et al., 2017; Safi et al., 2021), with many undergraduate
55 students (Alkhateeb et al., 2019) and staffs (Fountaine et al., 2014) were found
56 to be inactive. A previous study conducted by Pengpid & Peltzer (2021) on

57 undergraduate students in 23 countries found that 41.4% failed to meet the
58 recommended physical activity (PA) levels based on a thorough assessment of
59 the overall PA (Acebes-Sánchez et al., 2019). In compliance with the findings,
60 recent WHO reported that 15% of adults of all types of jobs, including teachers
61 in the South-East Asia region, were not compliant with the WHO recommended
62 levels of PA (Uddin et al., 2017).

63 Previous studies provide several explanations that may suggest why many
64 students, teachers, and adults do not actively engage in regular physical activity.
65 For instance, evidence suggests that “time availability” is the primary barrier that
66 prevents adults from fulfilling the recommended guideline of physical activity
67 (Brown et al., 2014; Edmunds et al., 2013; Joseph et al., 2015), such as lack of
68 free time due to tight schedule at school or university or obligation in social and
69 family life (Kljajević et al., 2022). Long periods of sedentary time has also been
70 found to be the major cause of the decline in physical activity among the
71 university community, especially during the pandemic situation as it led them to
72 be confined to their homes (Fountain et al., 2014; Legido-Quigley et al., 2020;
73 Romero-Blanco et al., 2020).

74 A suggestion from a previous study proposed that research must focus on
75 the level of physical activity amongst staff in the workplaces who are likely being
76 overlooked (Jackson et al., 2014). However, despite of the suggestion, only a few
77 studies have focused on students and employees within the higher education
78 sector, especially the college or university (Safi et al., 2021). Most of the previous
79 research mainly focused on PA levels of one specific university member and
80 classified them as a homogeneous group. Whereas, due to the cultural differences
81 across departments or majors, it is essential to know that a university has a diverse
82 range of members or communities with its own characteristics. Therefore, this
83 study was conducted to measure and evaluate the current level of physical activity
84 amongst the university community.

85

86 **Materials and methods**

87 *Study participants*

88 This study used a cross-sectional design with 2698 university students and
89 355 lecturers across seven faculties, one postgraduate program, and one
90 vocational program at Universitas Negeri Surabaya involved as participants.
91 Study inclusion criteria common to both samples included: (1) current enrolment
92 as an active undergraduate student or an active lecturer at the university, based
93 on data retrieved from Republic of Indonesia's Higher Education Database
94 (PDDIKTI); (2) completing a self-administered questionnaire comprised of a
95 number of measures during November 2021.

96

97 *Study organization*

98 The online survey comprised of two sections which assessed subjective
99 characteristics of participants and a structured questionnaire modified from the
100 WHO Global Physical Activity Questionnaire (GPAQ) that has been translated
101 into Indonesian, to measure the level of physical activity. Respondents were
102 asked to report the number of days and duration of activities spent on studying or
103 working, transporting, and leisure or recreational activities, comprising of 16
104 items in total and 1 question on sedentary behaviour. Participants were excluded
105 if data pertaining to each item of GPAQ was not reported. MET-minutes/week
106 METs or Metabolic Equivalents were used to express the intensity of physical
107 activity and were also used for the analysis of the GPAQ data. The level of PA
108 was then classified into three categories: (a) low PA (METs value less than 600);
109 (b) moderate PA (METs value 600 – 3000); and (c) high PA (METs value more
110 than 3000) (Uddin et al., 2017).

111

112 *Statistical analysis*

113 All statistical tests were carried out using SPSS 21 for Windows. The
114 standard univariate statistic was used to describe the study population; means and

standard deviation were used for continuous variables, while frequency and percentage were used for categorical variables. The difference in the characteristic of participants was analysed using Chi-Square. Mann-Whitney test was conducted to determine the difference in and the level of physical activity between students and lecturers. In all instances, the level of significance was set at $p < 0.05$.

121

122 Results

123 This research aimed to measure the level of physical activity of lecturers
124 and university students across majors and programs. Most of the student
125 participants were female (71.39%) with average bodyweight, height, and BMI
126 was 54.65 ± 11.00 kg, 159.25 ± 7.00 cm, and 22.08 ± 5.55 kg/m², respectively.
127 While the majority of lecturer participants comprised of male (52.68%), with an
128 average of age was 48.99 ± 102.28 years and had higher bodyweight ($69.25 \pm$
129 15.74 kg), height (161.55 ± 13.14 cm), as well as BMI (34.52 ± 5.38 kg/m²)
130 compared to the students. In terms of BMI, most of the students had normal BMI
131 (58.82%), while almost half of the lecturers had BMI in the overweight category
132 (42.82%). Both students and lecturers in all majors and programs did physical
133 activity at least once a week, did not smoke, had a moderate level of PA, and only
134 a few of them had NCD's comorbid (Table 1).

135

136 **Table 1.** Socio-demography characteristic of study participants

Characteristics	Student	Lecturer	P (sig)
Gender (n, %)			
Male	772 (28.61)	187 (52.68)	0.214
Female	1926 (71.39)	168 (47.32)	
Age (year; mean \pm SD)	20.41 ± 3.41	48.99 ± 102.28	0.001*
Bodyweight (kg; mean \pm SD)	54.65 ± 11.00	69.25 ± 15.74	0.023*
Height (cm; mean \pm SD)	159.25 ± 7.00	161.55 ± 13.14	0.156

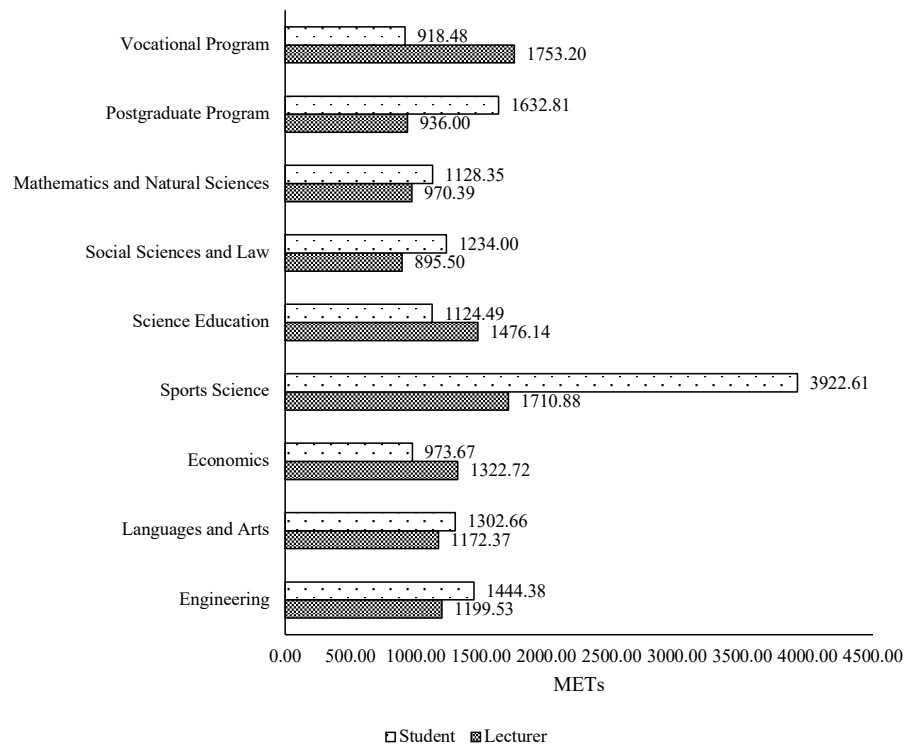
Characteristics	Student	Lecturer	P (sig)
Body mass index (BMI) (kg/m²; mean \pm SD)	22.08 \pm 5.55	34.52 \pm 5.38	0.015*
BMI category (n, %)			
Underweight	588 (21.79)	9 (2.54)	0.412
Normal	1587 (58.82)	147 (41.41)	
Overweight	383 (14.20)	152 (42.82)	
Obese	140 (5.19)	47 (13.24)	
Frequency of PA (n, %)			
Never	456 (16.90)	43 (12.11)	0.047**
Once a week	1036 (38.40)	117 (32.96)	
Twice a week	520 (19.27)	73 (20.56)	
Three times a week	331 (12.27)	60 (16.90)	
Almost everyday	255 (13.16)	62 (17.46)	
Levels of PA (n, %)			
Low	1109 (41.10)	132 (37.18)	0.360
Moderate	1214 (45.00)	185 (52.11)	
Vigorous	375 (13.90)	38 (10.70)	
METs (min/week, mean \pm SD)	1612.81 \pm 542.21	1178.0 \pm 694.54	0.011*
Smoking status (n, %)			
Yes	965 (35.77)	95 (26.76)	0.214
No	1733 (64.23)	260 (73.24)	
Present of NCD (n, %)			
Hypertension	49 (1.82)	23 (6.48)	0.335
Hypotension	196 (7.26)	11 (3.10)	
Asthma	83 (3.08)	5 (1.41)	
Diabetes mellitus type II	25 (0.93)	7 (1.97)	
Vision disorder	99 (3.67)	16 (4.51)	
Osteoporosis	10 (0.37)	40 (11.27)	
Others	481 (17.83)	45 (12.68)	
None	1755 (65.05)	208 (58.59)	

*significantly different using Mann Whitney (p<0.05)

**significantly different using Chi-Square test (p<0.05)

Mann Whitney test shows that age (p = 0.001), bodyweight (p = 0.023), body mass index (p = 0.015), and METs score (p = 0.011) were significantly different between students and lecturers. Analysis of categorical data using the

143 Chi-Square test shows that only the frequency of physical activity in a week
 144 differs statistically ($p = 0.047$).



145
 146
 147 **Figure 1.** The results of the MET scores of lecturers and students
 148 across different majors and programs
 149 The MET values of lecturers and students across different majors and study
 150 programs based on the results of the GPAQ questionnaire. Students from the
 151 Sports Science major had the highest METs scores, 3922.61 minutes/week and
 152 students from Vocational programs had the lowest level of METs (918.48
 153 minutes/week). Meanwhile, the lecturers obtained the highest and lowest MET
 154 scores from Vocational programs and Social Sciences and Law majors with a

score of 1753.20 and 895.50 minutes/week. Furthermore, to determine the difference between the METs scores of lecturers and students in each major and program, a different test was carried out using the Mann Whitney as the data was not normally distributed (Figure 1).

Table 2. Differences in METs between lecturers and students across majors/programs

Major / Program	n	Mean \pm SD	P (sig)
Engineering	Lecturer = 58	1199.53 \pm 1531.37	0.946
	Student = 436	1444.38 \pm 2002.68	
Languages and Arts	Lecturer = 50	1172.37 \pm 1308.26	0.757
	Student = 289	1302.66 \pm 1833.73	
Economics	Lecturer = 43	1322.72 \pm 1345.29	0.023*
	Student = 195	973.69 \pm 1318.17	
Sports Science	Lecturer = 53	1710.88 \pm 1474.63	0.000*
	Student = 292	3922.61 \pm 3594.54	
Education	Lecturer = 65	1476.14 \pm 1640.34	0.011*
	Student = 861	1124.49 \pm 1606.07	
Social Sciences and Law	Lecturer = 24	895.50 \pm 721.08	0.714
	Student = 227	1234.00 \pm 2393.47	
Mathematics and Natural Sciences	Lecturer = 42	970.39 \pm 969.84	0.977
	Student = 189	1128.35 \pm 1307.38	
Postgraduate Program	Lecturer = 5	936.00 \pm 545.97	0.836
	Student = 87	1632.81 \pm 2072.53	
Vocational Program	Lecturer = 15	918.48 \pm 1234.13	0.082
	Student = 122	1753.20 \pm 2197.25	

*significantly different using the Mann Whitney test ($p < 0.05$)

Table 2 presents there was a significant difference in the METs scores between lecturers and students in three majors, which were Economics, Sports Science, and Science Education ($p < 0.05$). The percentage of physical activity level category was then calculated based on the METs values. The results are presented in the figure below.

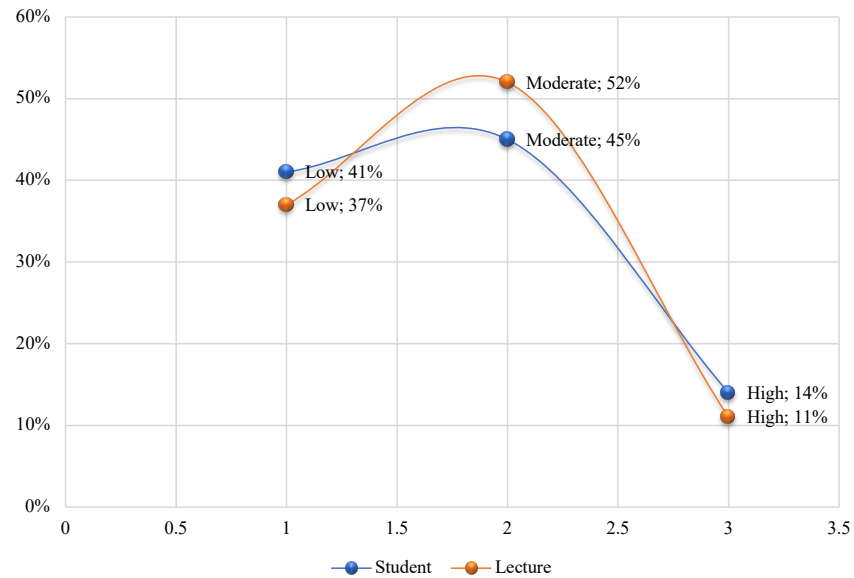


Figure 2. The physical activity level of students and lecturer

The majority of respondents had moderate physical activity levels with a percentage of 45.0% for students and 52% for lecturers. The second-largest percentage is in the low category for both lecturers and students. Then the smallest percentage is in the high category for both the lecturers and students. It shows that the academic community's overall physical activity tends to be at a moderate level, as seen from the percentage of categories (Figure 2).

Discussion

There is a lack of research that comprehensively assesses the PA levels for students and lecturers in all majors and programs at the University, especially in Indonesia. Identifying particular populations such as students and lecturers is

180 very interesting because they are a specific and busy population with a regular
181 timetable who spend most of their time studying and teaching for lecturers during
182 their weekdays (Arias-Palencia et al., 2015). This present study has several
183 noteworthy findings that could be highlighted. In general, the level of physical
184 activity of students and lecturers was mainly in the moderate category. However,
185 the category of low physical activity level was also in high percentage. These
186 findings showed that the level of physical activity of all participants in general
187 still tends to be low. Low physical activity is a major risk factor for many adverse
188 health conditions (Lee, Shiroma, Lobelo, Puska, Blair, & Katzmarzyk, 2012),
189 especially the world's major non-communicable diseases, and has a negative
190 effect on the quality of life and mental health (Guthold et al., 2018). Physical
191 activity is one way to prevent and reduce the risk of non-communicable diseases
192 such as obesity (Ekelund et al., 2016), which is the prevalence continues to
193 increase due to changing lifestyles with technological advances and the
194 increasingly widespread use of machines, thereby reducing a person's physical
195 activity (Peyman et al., 2018; Safi et al., 2021).

196 In conformity with the METs scores obtained from the participants,
197 students of the Sports Science major got the highest average METs scores. This
198 is also conformable with findings reported by Alkatan et al., (2021) which is
199 shown that the PA level among physical education college students in Kuwait
200 was relatively high. It is due to the lecture process, students are taught to exercise
201 and do physical activities. They demonstrate the lecture material by doing sports

202 activities so that their physical activity is high enough to have an average MET
203 of 3922.61 minutes per week. Besides, many Sports Science students are
204 collegiate student-athletes who are still active or former athletes who joined many
205 sports clubs. Hence, their participation in sports activities is greater than their
206 peers in other majors' (Gayles & Hu, 2009).

207 Additionally, during the learning activities, both lecturers and students of
208 Sports Science are mainly involved in discussions or interactive dialogues about
209 the importance of sports, physical activity, and a healthy lifestyle. Therefore,
210 Sport Science students tend to have better sports literacy and physical activity
211 (Bulqini et al., 2021). With good physical literacy, students will have the results
212 of motor skills, environmental context, and a broader affective social learning
213 process. Students who receive physical education-related courses at college or
214 university are more likely to exhibit positive social life perceptions and have a
215 better-coping stress mechanism (Beaudoin et al., 2018; Choi et al., 2021). Good
216 physical and health literacy also plays a role in positive health behaviours
217 (Cairney et al., 2019; Klinker et al., 2020; Zhang et al., 2021), as stated by a
218 previous study that health literacy enables people to build their knowledge, skills,
219 and potential to make positive behavioural changes. Improving health literacy is
220 more likely to lead to sustainable behaviour change given that lower levels of
221 health literacy are associated with poorer health outcomes (Visscher et al., 2018)
222 and academic performance (Bulqini et al., 2021).

223 Based on the findings, lecturers' METs scores tend to be lower than
224 students' (see Table 1 and Figure 1). One of many possible reasons that could
225 explain this finding was related to age. Sun et al (2013) stated in their research
226 that older people tend to have lower levels of physical activity than young people.
227 While the lecturers may be more knowledgeable about the health benefits of
228 physical activity, it does not mean that their knowledge will always equate to
229 action. Time availability, fatigue, motivation, and the increased use of technology
230 are some of the barriers applicable to this population (Whipple et al., 2008). Time
231 availability that lecturers specifically allocate to their works appears to cause a
232 major impact upon the declining engagement of physical activity on a daily basis
233 (da Silva et al., 2018). It was reiterated by other studies which reported that adults
234 across workplaces spent as much as 60% - 70% of their waking time to work,
235 with more than 75% of it being sedentary (Edge et al., 2017; Headley et al., 2018;
236 Waters et al., 2016), which is most of their time is engaged in prolonged sitting
237 (Mustar et al., 2021). Several cross-sectional studies reported that the increase in
238 sedentary activity at work was linked to lower productivity (Puig-Ribera et al.,
239 2015) and fatigue (Rosenkranz et al., 2020). Therefore, it is suggested that the
240 university should implement appropriate interventions to increase physical
241 activity, especially for the lecturers and staff, to ensure they are provided with
242 opportunities to stay active during working hours (Safi et al., 2021) and increase
243 their work performance.

244 Being an academic includes a busy work schedule and a long duration of
245 scientific activities. Because of this, lecturers are pushed into being more
246 physically inactive and spend more time ~~on~~ sitting (Cinar & Bavli, 2014).
247 Nevertheless, the present study found that the lecturers working in the Vocational
248 and Sport Science program had the highest METs score. There is a need for more
249 studies to discuss this finding, but some explanations that may elucidate this
250 finding ~~is~~ are that Vocational and Sport Science programs comprise more
251 practical teaching that urges both lecturers and students to actively move rather
252 than just sit. It is in agreement with a previous study which indicated that teachers
253 who teach practical courses or lectures tend to be more physically active and
254 spend more time doing leisure physical activity compared to other peers (Bogaert
255 et al., 2014; Erick & Smith, 2011). However, a more detailed analysis regarding
256 the relationship between physical activity level and teaching subject area is
257 needed to confirm this finding.

258 Despite revealing the results that impact physical activity levels in both
259 lecturers and students, this present study has some limitations that can be
260 highlighted. First, the data collected through GPAQ and self-reported methods
261 are prone to human error, such as overestimating or vice versa. Nonetheless, this
262 can be prevented by using tools to monitor PA, such as accelerometers, so that
263 the results obtained can be more accurate. Second, the limitation of this study
264 included the use of a convenience sample that was limited to only students and
265 lecturers who filled out the questionnaire. Geographic location and the lack of
266 variability of the socio-demographic factors would also limit the ability to
267 generalize the findings to other populations.

268 **Conclusions**

269 Most of the students and lecturers had a low level of PA, with the highest
270 METs was found in students coming from Sport Science majors and lecturers
271 working in Vocational programs. Findings from this study led as the reference in
272 developed strategies and policies aimed at promoting and improving physical
273 activity and the welfare of the university community. Furthermore, the university
274 needs to advocate and motivate the academic community to increase awareness
275 of a healthy lifestyle, mainly engaging in light physical activity during working
276 days to maintain health, fitness, well-being, and quality of life. Additional
277 population-based studies, preferably longitudinal studies with representative
278 samples from state and private universities and objective measurement of
279 physical activity, are needed to understand the factors associated with physical
280 activity in the university community, particularly among students and lecturers
281 who spent most of their time with students and lecturers at university.

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286 **Conflict of interest**

287 No conflict of interest to declare.

288 **References**

289 Acebes-Sánchez, J., Diez-Vega, I., & Rodriguez-Romo, G. (2019). Physical
290 activity among spanish undergraduate students: A descriptive correlational
291 study. *International Journal of Environmental Research and Public*
292 *Health*, 16(15), 2770. <https://doi.org/10.3390/ijerph16152770>

293 Alkatan, M., Alsharji, K., Akbar, A., Alshareefi, A., Alkhalaf, S., Alabduljader,
 294 K., & Al-Hazzaa, H. M. (2021). Physical activity and sedentary behaviors
 295 among active college students in Kuwait relative to gender status. *Journal*
 296 *of Preventive Medicine and Hygiene*, 62(2), E407–E414.
 297 <https://doi.org/10.15167/2421-4248/jpmh2021.62.2.1650>

298 Alkhateeb, S. A., Alkhameesi, N. F., Lamfon, G. N., Khawandanh, S. Z., Kurdi,
 299 L. K., Faran, M. Y., Khoja, A. A., Bukhari, L. M., Aljahdali, H. R., Ashour,
 300 N. A., Bagasi, H. T., Delli, R. A., Khoja, O. A., & Safdar, O. Y. (2019).
 301 Pattern of physical exercise practice among university students in the
 302 Kingdom of Saudi Arabia (before beginning and during college): A cross-
 303 sectional study. *BMC Public Health*, 19(1), 1716.
 304 <https://doi.org/10.1186/s12889-019-8093-2>

305 Anderson, E., & Durstine, J. L. (2019). Physical activity, exercise, and chronic
 306 diseases: A brief review. *Sports Medicine and Health Science*, 1(1), 3–10.
 307 <https://doi.org/10.1016/j.smhs.2019.08.006>

308 Arias-Palencia, N. M., Solera-Martínez, M., Gracia-Marco, L., Silva, P.,
 309 Martínez-Vizcaíno, V., Cañete-García-Prieto, J., & Sánchez-López, M.
 310 (2015). Levels and Patterns of Objectively Assessed Physical Activity and
 311 Compliance with Different Public Health Guidelines in University
 312 Students. *PLOS ONE*, 10(11), e0141977.
 313 <https://doi.org/10.1371/journal.pone.0141977>

314 Beaudoin, C., Parker, T., Tiemersma, K., & Lewis, C. (2018). Evaluating
 315 university physical activity courses from student and instructor
 316 perspectives. *Journal of Physical Education, Recreation & Dance*, 89(1),
 317 7–11. <https://doi.org/10.1080/07303084.2017.1390508>

318 Bogaert, I., De Martelaer, K., Deforche, B., Clarys, P., & Zinzen, E. (2014).
 319 Associations between different types of physical activity and teachers’
 320 perceived mental, physical, and work-related health. *BMC Public Health*,
 321 14(1), 534. <https://doi.org/10.1186/1471-2458-14-534>

322 Brown, T. C., Volberding, J., Baghurst, T., & Sellers, J. (2014). Faculty/staff
 323 perceptions of a free campus fitness facility. *International Journal of*
 324 *Workplace Health Management*, 7(3), 156–170.
 325 <https://doi.org/10.1108/IJWHM-05-2013-0020>

326 Bulqini, A., Sholikhah, A. M., Ridwan, M., & Prakoso, B. B. (2021). Impact of
 327 health-related lifestyle (HRL) factors on student academic achievement.
 328 *DEGRES*, 20(1), 265–277. <https://doi.org/10.1877/degres.v20i1.61>

329 Cairney, J., Dudley, D., Kwan, M., Bulten, R., & Kriellaars, D. (2019). Physical
 330 literacy, physical activity and health: Toward an evidence-informed
 331 conceptual model. *Sports Medicine (Auckland, N.Z.)*, 49(3), 371–383.
 332 <https://doi.org/10.1007/s40279-019-01063-3>

333 Calestine, J., Bopp, M., Bopp, C. M., & Papalia, Z. (2017). College student work
 334 habits are related to physical activity and fitness. *International Journal of*
 335 *Exercise Science*, 10(7), 1009–1017.

336 Choi, S. M., Sum, K. W. R., Leung, F. L. E., Ha, S. C. A., Sit, C., & Yeung, K.
 337 H. (2021). Predictors of physical activity levels in university physical
 338 education implementing sport education. *Journal of Sports Science &*
 339 *Medicine*, 20(3), 516. <https://doi.org/10.52082/jssm.2021.516>

340 Chu, A. H. Y., Koh, D., Moy, F. M., & Müller-Riemenschneider, F. (2014). Do
 341 workplace physical activity interventions improve mental health
 342 outcomes? *Occupational Medicine (Oxford, England)*, 64(4), 235–245.
 343 <https://doi.org/10.1093/occmed/kqu045>

344 Cinar, S., & Bavli, Ö. (2014). Investigation the physical activity level of
 345 academics: Çanakkale sample. *Türk Spor ve Egzersiz Dergisi*, 16(3), 8–12.

346 da Silva, I. C. M., Mielke, G. I., Bertoldi, A. D., Arrais, P. S. D., Luiza, V. L.,
 347 Mengue, S. S., & Hallal, P. C. (2018). Overall and leisure-time physical
 348 activity among brazilian adults: National survey based on the global
 349 physical activity questionnaire. *Journal of Physical Activity & Health*,
 350 15(3), 212–218. <https://doi.org/10.1123/jpah.2017-0262>

351 Edge, C. E., Cooper, A. M., & Coffey, M. (2017). Barriers and facilitators to
 352 extended working lives in Europe: A gender focus. *Public Health Reviews*,
 353 38(1), 2. <https://doi.org/10.1186/s40985-017-0053-8>

354 Edmunds, S., Hurst, L., & Harvey, K. (2013). Physical activity barriers in the
 355 workplace: An exploration of factors contributing to non-participation in a
 356 UK workplace physical activity intervention. *International Journal of*

357 *Workplace Health Management*, 6(3), 227–240.
 358 <https://doi.org/10.1108/IJWHM-11-2010-0040>

359 Ekelund, U., Steene-Johannessen, J., Brown, W. J., Fagerland, M. W., Owen, N.,
 360 Powell, K. E., Bauman, A., & Lee, I.-M. (2016). Does physical activity
 361 attenuate, or even eliminate, the detrimental association of sitting time with
 362 mortality? A harmonised meta-analysis of data from more than 1 million
 363 men and women. *The Lancet*, 388(10051), 1302–1310.
 364 [https://doi.org/10.1016/S0140-6736\(16\)30370-1](https://doi.org/10.1016/S0140-6736(16)30370-1)

365 Elmagd, M. A. (2016). Benefits, need and importance of daily exercise.
 366 *International Journal of Physical Education, Sports and Health*, 3(5), 22–
 367 27.

368 Erick, P. N., & Smith, D. R. (2011). A systematic review of musculoskeletal
 369 disorders among school teachers. *BMC Musculoskeletal Disorders*, 12,
 370 260. <https://doi.org/10.1186/1471-2474-12-260>

371 Fountaine, C. J., Piacentini, M., & Liguori, G. (2014). Occupational sitting and
 372 physical activity among university employees. *International Journal of*
 373 *Exercise Science*, 7(4), 295–201.

374 Gayles, J. G., & Hu, S. (2009). The influence of student engagement and sport
 375 participation on college outcomes among division I student athletes. *The*
 376 *Journal of Higher Education*, 80(3), 315–333.

377 Guthold, R., Stevens, G. A., Riley, L. M., & Bull, F. C. (2018). Worldwide trends
 378 in insufficient physical activity from 2001 to 2016: A pooled analysis of

379 358 population-based surveys with 1·9 million participants. *The Lancet*
380 *Global Health*, 6(10), e1077–e1086. [https://doi.org/10.1016/S2214-](https://doi.org/10.1016/S2214-109X(18)30357-7)
381 109X(18)30357-7

382 Guthold, R., Stevens, G. A., Riley, L. M., & Bull, F. C. (2020). Global trends in
383 insufficient physical activity among adolescents: A pooled analysis of 298
384 population-based surveys with 1·6 million participants. *The Lancet Child*
385 *& Adolescent Health*, 4(1), 23–35. [https://doi.org/10.1016/S2352-](https://doi.org/10.1016/S2352-4642(19)30323-2)
386 4642(19)30323-2

387 Harvey, S. B., Øverland, S., Hatch, S. L., Wessely, S., Mykletun, A., & Hotopf,
388 M. (2018). Exercise and the Prevention of Depression: Results of the
389 HUNT Cohort Study. *The American Journal of Psychiatry*, 175(1), 28–36.
390 <https://doi.org/10.1176/appi.ajp.2017.16111223>

391 Headley, S., Hutchinson, J., Wooley, S., Dempsey, K., Phan, K., Spicer, G.,
392 Janssen, X., Laguilles, J., & Matthews, T. (2018). Subjective and objective
393 assessment of sedentary behavior among college employees. *BMC Public*
394 *Health*, 18(1), 768. <https://doi.org/10.1186/s12889-018-5630-3>

395 Jackson, C., Lewis, K., Conner, M., Lawton, R., & R.C. McEachan, R. (2014).
396 Are incremental changes in physical activity and sedentary behaviours
397 associated with improved employee health?: A 12-month prospective
398 study in five organisations. *International Journal of Workplace Health*
399 *Management*, 7(1), 16–39. <https://doi.org/10.1108/IJWHM-03-2013-0013>

400 Joseph, R. P., Ainsworth, B. E., Keller, C., & Dodgson, J. E. (2015). Barriers to
 401 physical activity among african american women: An integrative review of
 402 the literature. *Women & Health*, 55(6), 679–699.
 403 <https://doi.org/10.1080/03630242.2015.1039184>

404 Kim, Y. S., Park, Y. S., Allegrante, J. P., Marks, R., Ok, H., Ok Cho, K., &
 405 Garber, C. E. (2012). Relationship between physical activity and general
 406 mental health. *Preventive Medicine*, 55(5), 458–463.
 407 <https://doi.org/10.1016/j.ypmed.2012.08.021>

408 Klinker, C. D., Aaby, A., Ringgaard, L. W., Hjort, A. V., Hawkins, M., &
 409 Maindal, H. T. (2020). Health Literacy is Associated with Health
 410 Behaviors in Students from Vocational Education and Training Schools: A
 411 Danish Population-Based Survey. *International Journal of Environmental*
 412 *Research and Public Health*, 17(2), 671.
 413 <https://doi.org/10.3390/ijerph17020671>

414 Kljajević, V., Stanković, M., Đorđević, D., Trkulja-Petković, D., Jovanović, R.,
 415 Plazibat, K., Oršolić, M., Čurić, M., & Sporiš, G. (2022). Physical activity
 416 and physical fitness among university students—A systematic review.
 417 *International Journal of Environmental Research and Public Health*,
 418 19(1), 158. <https://doi.org/10.3390/ijerph19010158>

419 Lee, I.-M., Shiroma, E. J., Lobelo, F., Puska, P., Blair, S. N., & Katzmarzyk, P.
 420 T. (2012). Impact of physical inactivity on the world's major non-

421 communicable diseases. *Lancet*, 380(9838), 219–229.
 422 [https://doi.org/10.1016/S0140-6736\(12\)61031-9](https://doi.org/10.1016/S0140-6736(12)61031-9)

423 Lee, I.-M., Shiroma, E. J., Lobelo, F., Puska, P., Blair, S. N., Katzmarzyk, P. T.,
 424 & Lancet Physical Activity Series Working Group. (2012). Effect of
 425 physical inactivity on major non-communicable diseases worldwide: An
 426 analysis of burden of disease and life expectancy. *Lancet (London,*
 427 *England)*, 380(9838), 219–229. [https://doi.org/10.1016/S0140-](https://doi.org/10.1016/S0140-6736(12)61031-9)
 428 [6736\(12\)61031-9](https://doi.org/10.1016/S0140-6736(12)61031-9)

429 Legido-Quigley, H., Mateos-García, J. T., Campos, V. R., Gea-Sánchez, M.,
 430 Muntaner, C., & McKee, M. (2020). The resilience of the Spanish health
 431 system against the COVID-19 pandemic. *The Lancet Public Health*, 5(5),
 432 e251–e252. [https://doi.org/10.1016/S2468-2667\(20\)30060-8](https://doi.org/10.1016/S2468-2667(20)30060-8)

433 Mathers, C. D. (2020). History of global burden of disease assessment at the
 434 World Health Organization. *Archives of Public Health*, 78(1), 77.
 435 <https://doi.org/10.1186/s13690-020-00458-3>

436 Moore, S. C., Lee, I.-M., Weiderpass, E., Campbell, P. T., Sampson, J. N.,
 437 Kitahara, C. M., Keadle, S. K., Arem, H., Berrington de Gonzalez, A.,
 438 Hartge, P., Adami, H.-O., Blair, C. K., Borch, K. B., Boyd, E., Check, D.
 439 P., Fournier, A., Freedman, N. D., Gunter, M., Johannson, M., ... Patel, A.
 440 V. (2016). Association of Leisure-Time Physical Activity With Risk of 26
 441 Types of Cancer in 1.44 Million Adults. *JAMA Internal Medicine*, 176(6),
 442 816–825. <https://doi.org/10.1001/jamainternmed.2016.1548>

443 Mustar, Y. S., Nissa, F. A. K., Hariyanto, A., Pramono, B. A., & Susanto, I. H.
 444 (2021). *Self-Reported Assessment of Occupational Sitting and Physical*
 445 *Activity Among Employees.* 438–444.
 446 <https://doi.org/10.2991/assehr.k.211223.076>

447 Pengpid, S., & Peltzer, K. (2021). Prevalence and correlates of multiple
 448 behavioural risk factors of non-communicable diseases among university
 449 students from 24 countries. *Journal of Public Health*, 43(4), 857–866.
 450 <https://doi.org/10.1093/pubmed/fdaa138>

451 Peyman, N., Rezai-Rad, M., Tehrani, H., Gholian-Aval, M., Vahedian-
 452 Shahroodi, M., & Heidarian Miri, H. (2018). Digital media-based health
 453 intervention on the promotion of women's physical activity: A quasi-
 454 experimental study. *BMC Public Health*, 18(1), 134.
 455 <https://doi.org/10.1186/s12889-018-5025-5>

456 Puig-Ribera, A., Martínez-Lemos, I., Giné-Garriga, M., González-Suárez, Á. M.,
 457 Bort-Roig, J., Fortuño, J., Muñoz-Ortiz, L., McKenna, J., & Gilson, N. D.
 458 (2015). Self-reported sitting time and physical activity: Interactive
 459 associations with mental well-being and productivity in office employees.
 460 *BMC Public Health*, 15, 72. <https://doi.org/10.1186/s12889-015-1447-5>

461 Rajappan, R., Selvaganapathy, K., & Liew, L. (2015). Physical activity level
 462 among university students: A cross sectional survey. *International Journal*
 463 *of Physiotherapy and Research*, 3(6), 1336–1343.
 464 <https://doi.org/10.16965/ijpr.2015.202>

465 Rodríguez-Fernández, A., & Ramos-Díaz, A. Z.-R.-B. and E. (2017). Quality of
 466 life and physical activity: Their relationship with physical and
 467 psychological well-being. In *Quality of Life and Quality of Working Life*.
 468 IntechOpen. <https://doi.org/10.5772/intechopen.69151>

469 Romero-Blanco, C., Rodríguez-Almagro, J., Onieva-Zafra, M. D., Parra-
 470 Fernández, M. L., Prado-Laguna, M. del C., & Hernández-Martínez, A.
 471 (2020). Physical activity and sedentary lifestyle in university students:
 472 Changes during confinement due to the covid-19 pandemic. *International*
 473 *Journal of Environmental Research and Public Health*, 17(18), 6567.
 474 <https://doi.org/10.3390/ijerph17186567>

475 Rosenkranz, S. K., Mailey, E. L., Umansky, E., Rosenkranz, R. R., & Ablah, E.
 476 (2020). Workplace sedentary behavior and productivity: A cross-sectional
 477 study. *International Journal of Environmental Research and Public*
 478 *Health*, 17(18), E6535. <https://doi.org/10.3390/ijerph17186535>

479 Safi, A., Cole, M., Kelly, A. L., & Walker, N. C. (2021). An evaluation of
 480 physical activity levels amongst university employees. *Advances in*
 481 *Physical Education*, 11(2), 158–171.
 482 <https://doi.org/10.4236/ape.2021.112012>

483 Sun, F., Norman, I. J., & While, A. E. (2013). Physical activity in older people:
 484 A systematic review. *BMC Public Health*, 13(1), 449.
 485 <https://doi.org/10.1186/1471-2458-13-449>

486 Uddin, R., Khan, A., & Burton, N. W. (2017). Prevalence and sociodemographic
 487 patterns of physical activity among Bangladeshi young adults. *Journal of*
 488 *Health, Population and Nutrition*, 36(1), 31.
 489 <https://doi.org/10.1186/s41043-017-0108-y>
 490 Van Dyck, D., Cerin, E., De Bourdeaudhuij, I., Hinckson, E., Reis, R. S., Davey,
 491 R., Sarmiento, O. L., Mitas, J., Troelsen, J., MacFarlane, D., Salvo, D.,
 492 Aguinaga-Ontoso, I., Owen, N., Cain, K. L., & Sallis, J. F. (2015).
 493 International study of objectively measured physical activity and sedentary
 494 time with body mass index and obesity: IPEN adult study. *International*
 495 *Journal of Obesity* (2005), 39(2), 199–207.
 496 <https://doi.org/10.1038/ijo.2014.115>
 497 Visscher, B. B., Steunenbergh, B., Heijmans, M., Hofstede, J. M., Devillé, W., van
 498 der Heide, I., & Rademakers, J. (2018). Evidence on the effectiveness of
 499 health literacy interventions in the EU: A systematic review. *BMC Public*
 500 *Health*, 18(1), 1414. <https://doi.org/10.1186/s12889-018-6331-7>
 501 Waters, C. N., Ling, E. P., Chu, A. H. Y., Ng, S. H. X., Chia, A., Lim, Y. W., &
 502 Müller-Riemenschneider, F. (2016). Assessing and understanding
 503 sedentary behaviour in office-based working adults: A mixed-method
 504 approach. *BMC Public Health*, 16(1), 360. [https://doi.org/10.1186/s12889-](https://doi.org/10.1186/s12889-016-3023-z)
 505 [016-3023-z](https://doi.org/10.1186/s12889-016-3023-z)

506 Whipple, K., Kinney, J., & Kattenbraker, M. (2008). Maintenance of physical
507 activity among faculty and staff in university settings. *Health Educator*,
508 40(1), 21–28.

509 WHO. (2009). *Global health risks: Mortality and burden of disease attributable*
510 *to selected major risks*. World Health Organization.
511 <https://apps.who.int/iris/handle/10665/44203>

512 WHO. (2020). *WHO Guideline on Physical Activity and Sedentary Behaviour*.
513 World Health Organization.
514 [https://apps.who.int/iris/bitstream/handle/10665/337001/9789240014886-](https://apps.who.int/iris/bitstream/handle/10665/337001/9789240014886-eng.pdf)
515 [eng.pdf](https://apps.who.int/iris/bitstream/handle/10665/337001/9789240014886-eng.pdf)

516 Zhang, F., Or, P. P. L., & Chung, J. W. Y. (2021). How different health literacy
517 dimensions influences health and well-being among men and women: The
518 mediating role of health behaviours. *Health Expectations: An*
519 *International Journal of Public Participation in Health Care and Health*
520 *Policy*, 24(2), 617–627. <https://doi.org/10.1111/hex.13208>

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PUBLICATION FEE



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[TMFV] New notification from Physical Education Theory and Methodology

1 message

Taras Tkachenko via TMFV Journal <mailer@tmfv.com.ua>

Wed, Jan 25, 2023 at 12:03 AM

Reply-To: Taras Tkachenko <tt@ovc.kharkov.ua>, Oleg Khudolii <tmfv@tmfv.com.ua>

To: Agus Hariyanto <agushariyanto@unesa.ac.id>

You have a new notification from Physical Education Theory and Methodology:

There is new activity in the discussion titled "[TMFV] Publication Fee" regarding the submission "Physical Activity Level Amongst University Students and Lecturers Across Majors and Programs in Indonesia".

Link: <https://tmfv.com.ua/journal/authorDashboard/submission/1829>

Physical Education Theory and Methodology

Messages

Note	From
<p>Dear Hariyanto et al.</p> <p>We'd like to inform you that your article "Physical Activity Level Amongst University Students and Lecturers Across Majors and Programs in Indonesia" has been approved for publication in <i>Physical Education Theory and Methodology</i>.</p> <p>Our publishing policy includes a publication fee, which is charged after acceptance of an article for publication. To continue the submission processing, please pay the publication fee, which is 200 USD. This fee reimburses our costs for publishing the journal.</p> <p>To pay the publication fee, please use this link: https://prt.mn/KY-3NckoKO</p> <p>For the convenience of authors, payments are made using payment cards. The corresponding invoice is sent from our payment partner. Payments with Visa and Mastercard cards are provided by the Ukrainian online payment service Portmone.com.</p> <p>Thank you for choosing our journal to publish your research article.</p> <p>Best regards, Taras Tkachenko</p>	<p>tkachenko 2023-01-15 12:30 AM</p>
<p>Dear Hariyanto et al.</p> <p>Thank you for your payment.</p> <p>We are preparing your article for publication.</p> <p>Best regards, Taras Tkachenko</p>	<p>tkachenko 2023-01-24 06:03 PM</p>

PROOFREAD REQUEST



Agus Hariyanto <agushariyanto@unesa.ac.id>

[TMFV] Proofreading Request (Author)

1 message

Igor Kornijchuk / TMFV Journal via TMFV Journal <mailer@tmfv.com.ua>

Wed, Feb 22, 2023 at 8:59 PM

Replv-To: Igor Kornijchuk / TMFV Journal <igor@ovc.kharkov.ua>

To: Agus Hariyanto <agushariyanto@unesa.ac.id>

Dear Authors,

Your submission, "Physical Activity Level amongst University Students and Lecturers across Majors and Programs in Indonesia", to *Physical Education Theory and Methodology* now needs to be final proofread. We uploaded the galley of the article. Please view the file in section Publication/Galleys on the journal's website.

If you find any errors (printing and formatting), please inform us about them.

Best regards,
Igor Kornijchuk / TMFV Journal
igor@ovc.kharkov.ua