SUBMISSION

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[TMFV] Submission Acknowledgement

1 message

Oleg Khudolii <mailer@tmfv.com.ua> Sat, Sep 10, 2022 at 2:23 PM
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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

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[TMFV] Editor Decision

Oleg M. Khudolii via TMFV Journal <mailer@tmfv.com.ua> Tue, Jan 3, 2023 at 11:29 PM
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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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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.

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

Introduction

Previous studies have well-documented numerous health benefits of physical activity (PA) and exercise, with participation in moderate-intensity of physical activity on a daily basis is proved to enhance both the physical (Lee, Shiroma, Lobelo, Puska, Blair, Katzmarzyk, et al., 2012) 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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A suggestion from a previous study proposed that research must focus on the level of physical activity amongst staff in the workplaces who are likely being overlooked (Jackson et al., 2014). However, despite of the suggestion, only a few studies have focused on students and employees within the higher education sector, especially the college or university (Safi et al., 2021). Most of the previous research mainly focused on PA levels of one specific university member and classified them as a homogeneous group. Whereas, due to the cultural differences across departments or majors, it is essential to know that a university has a diverse range of members or communities with its own characteristics. Therefore, this study was conducted to measure and evaluate the current level of physical activity amongst the university community.

Materials and methods

Study participants

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

Study organization

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

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/m^2, 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/m^2) 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 ± SD)	20.41 ± 3.41	48.99 ± 102.28	0.001*
Bodyweight (kg; mean ± SD)	54.65 ± 11.00	69.25 ± 15.74	0.023*
Height (cm; mean ± SD)	159.25 ± 7.00	161.55 ± 13.14	0.156
Body mass index (BMI) (kg/m^2; mean ± SD)	22.08 ± 5.55	34.52 ± 5.38	0.015*
BMI category (n, %)			
Underweight	588 (21.79)	9 (2.54)	
Normal	1587 (58.82)	147 (41.41)	0.412
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)	
Once a week	1036 (38.40)	117 (32.96)	0.047**
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 ± SD)	1612.81 ± 542.21	1178.0 ± 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)	
Hypotension	196 (7.26)	11 (3.10)	
Asthma	83 (3.08)	5 (1.41)	
Diabetes mellitus type II	25 (0.93)	7 (1.97)	0.335
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 ($p = 0.047$).

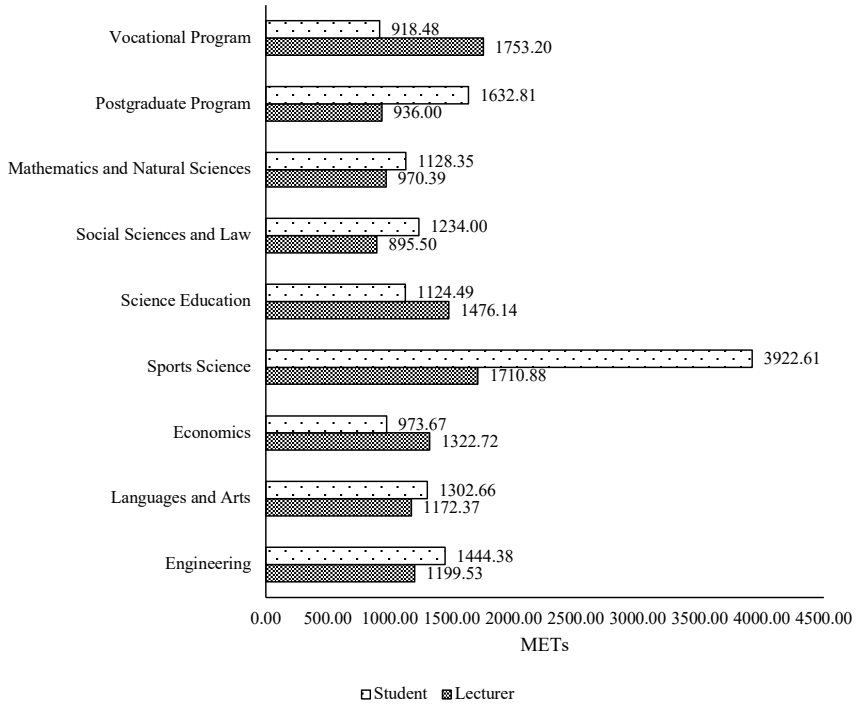

Figure 1. The results of the MET scores of lecturers and students across different majors and programs

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 ± SD**	**P (sig)**
Engineering	Lecturer = 58	1199.53 ± 1531.37	0.946

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

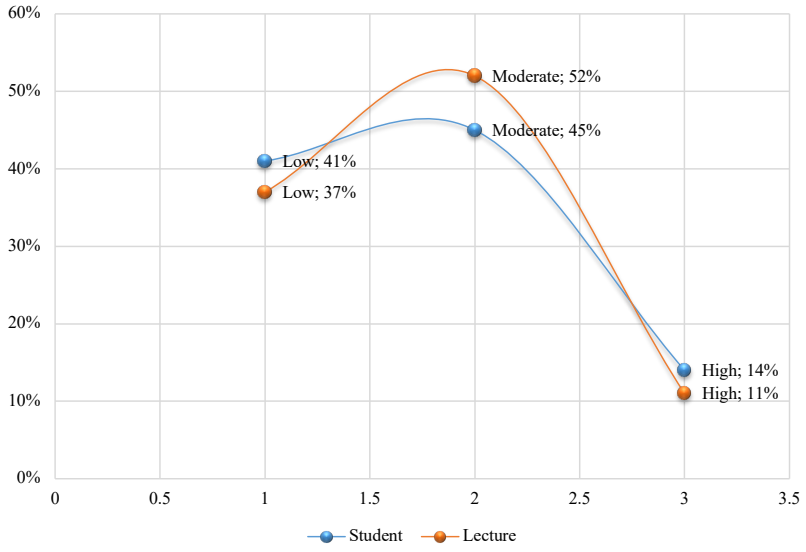

Figure 2. The physical activity level of students and lecturer

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).

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

Based on the findings, lecturers' METs scores tend to be lower than students' (see Table 1 and Figure 1). One of many possible reasons that could explain this finding was related to age. Sun

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et al (2013) stated in their research that older people tend to have lower levels of physical activity than young people. While the lecturers may be more knowledgeable about the health benefits of physical activity, it does not mean that their knowledge will always equate to action. Time availability, fatigue, motivation, and the increased use of technology are some of the barriers applicable to this population (Whipple et al., 2008). Time availability that lecturers specifically allocate to their works appears to cause a major impact upon the declining engagement of physical activity on a daily basis (da Silva et al., 2018). It was reiterated by other studies which reported that adults across workplaces spent as much as 60% - 70% of their waking time to work, with more than 75% of it being sedentary (Edge et al., 2017; Headley et al., 2018; Thivel et al., 2018; Waters et al., 2016), which is most of their time is engaged in prolonged sitting (Mustar et al., 2021). Several cross-sectional studies reported that the increase in sedentary activity at work was linked to lower productivity (Puig-Ribera et al., 2015) and fatigue (Rosenkranz et al., 2020). Therefore, it is suggested that the university should implement appropriate interventions to increase physical activity, especially for the lecturers and staff, to ensure they are provided with opportunities to stay active during working hours (Safi et al., 2021) and increase their work performance.

Being an academic includes a busy work schedule and a long duration of scientific activities. Because of this, lecturers are pushed into being more physically inactive and spend more time ~~on~~ sitting (Cinar & Bavli, 2014). Nevertheless, the present study found that the lecturers working in the Vocational and Sport Science program had the highest METs score. There is a need for more studies to discuss this finding, but some explanations that may elucidate this finding ~~is~~ are that Vocational and Sport Science programs comprise more practical teaching that urges both lecturers and students to actively move rather than just sit~~.~~ It is in agreement with a previous study which indicated that teachers who teach practical courses or lectures tend 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.

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Conflict of interest

No conflict of interest to declare.

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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.

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

Introduction

Previous studies have well-documented numerous health benefits of physical activity (PA) and exercise, with participation in moderate-intensity of physical activity on a daily basis is proved to enhance both the physical (Lee, Shiroma, Lobelo, Puska, Blair, Katzmarzyk, et al., 2012) 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). 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), 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; Legido-Quigley et al., 2020; Romero-Blanco et al., 2020).

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

Materials and methods

Study participants

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

Study organization

The online survey comprised of two sections which assessed subjective characteristics of participants and a structured questionnaire modified from the WHO Global Physical Activity Questionnaire (GPAQ) that has been translated into Indonesian, to measure the level of physical activity. Respondents were asked to report the number of days and duration of activities spent on studying or working, transporting, and leisure or recreational activities, comprising of 16 items in total and 1 question on sedentary behaviour. Participants were excluded if data pertaining to each item of GPAQ was not reported. MET-minutes/week METs or Metabolic Equivalents were used to express the intensity of physical activity and were also used for the analysis of the GPAQ data. The level of PA 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/m^2, 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/m^2) 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)	
Age (year; mean ± SD)	20.41 ± 3.41	48.99 ± 102.28	0.001*
Bodyweight (kg; mean ± SD)	54.65 ± 11.00	69.25 ± 15.74	0.023*
Height (cm; mean ± SD)	159.25 ± 7.00	161.55 ± 13.14	0.156

Characteristics	Student	Lecturer	P (sig)
Body mass index (BMI) (kg/m^2; mean ± SD)	22.08 ± 5.55	34.52 ± 5.38	0.015*
BMI category (n, %)			
Underweight	588 (21.79)	9 (2.54)	
Normal	1587 (58.82)	147 (41.41)	0.412
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)	
Once a week	1036 (38.40)	117 (32.96)	0.047**
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 ± SD)	1612.81 ± 542.21	1178.0 ± 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)	
Hypotension	196 (7.26)	11 (3.10)	
Asthma	83 (3.08)	5 (1.41)	
Diabetes mellitus type II	25 (0.93)	7 (1.97)	0.335
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 ($p = 0.047$).

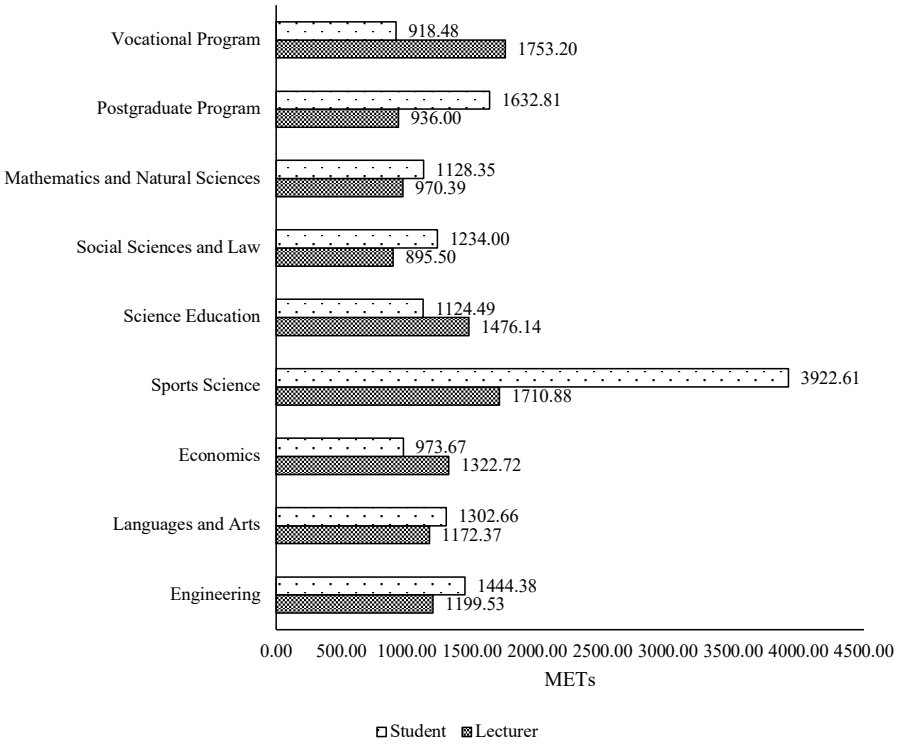

Figure 1. The results of the MET scores of lecturers and students across different majors and programs

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

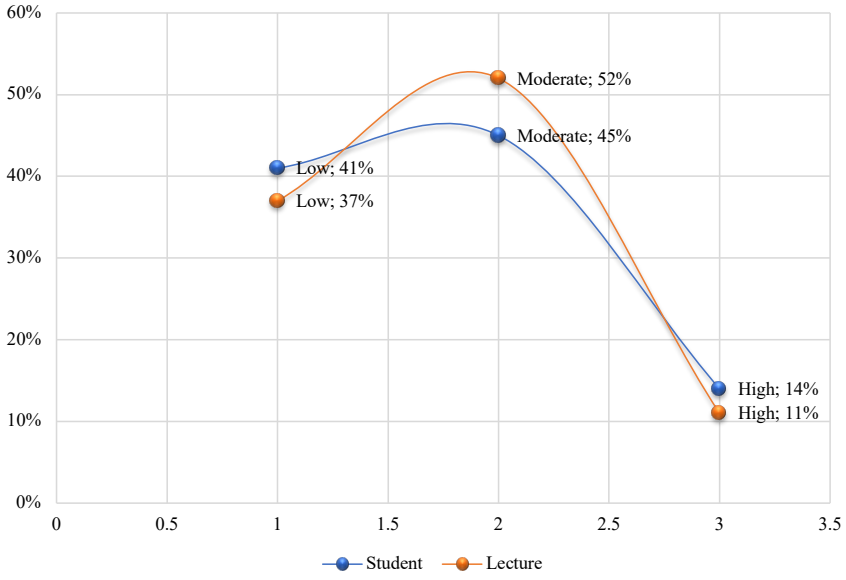

Figure 2. The physical activity level of students and lecturer

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).

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

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

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

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

Being an academic includes a busy work schedule and a long duration of scientific activities. Because of this, lecturers are pushed into being more physically inactive and spend more time ~~on~~ sitting (Cinar & Bavli, 2014). Nevertheless, the present study found that the lecturers working in the Vocational and Sport Science program had the highest METs score. There is a need for more studies to discuss this finding, but some explanations that may elucidate this finding ~~is~~ are that Vocational and Sport Science programs comprise more practical teaching that urges both lecturers and students to actively move rather than just sit. It is in agreement with a previous study which indicated that teachers who teach practical courses or lectures tend to be more physically active and spend more time doing leisure physical activity compared to 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.

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Conflict of interest

No conflict of interest to declare.

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PUBLICATION FEE

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1 message

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Physical Education Theory and Methodology

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1 message

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

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