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Physical Activity Levels of University of Cyberjaya Students During Pandemic

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ABSTRACT

Introduction: Numerous studies show that physical activity levels were much lower during the Covid-19 pandemic. Hence, it's essential to study the present trend in the amount of physical activity among university students in UOC during the Covid-19 outbreak and to ascertain how sociodemographic characteristics relate to physical activity among UOC students.

Objective: The objective was to analyze the current trend of physical activity level and to compare the physical activity level between students of different faculties of university students in UoC with different sociodemographic.

Methods: This is a cross-sectional study involving 416 students at University of Cyberjaya, aged between 18 to 30 years. A Google Form questionnaire based on International Physical Activity Questionnaire – Short Form (IPAQ-SF) was distributed via various social media platforms and saved contacts.

Results: Most respondents, 51%, are classified as "Moderate" in terms of physical activity level. The "Low" group accounted for 31% of answers, indicating that a significant proportion of students engage in relatively modest levels of physical exercise. In contrast, the "High" group includes 18% of responses, showing that a significant fraction of students is actively participating in greater levels of physical activity.

Conclusion: In summary, among students in University of Cyberjaya from different faculties are mostly irregularly active in current physical activity level. Moreover, comparing their physical activity level to pandemic, it has been increased currently due to their daily engagement towards moderate physical activities and always walking for at least 10 minutes at a time.

Keyword: Physical Activity Level, Covid-19 endemic, Students of different faculties of University of Cyberjaya, aged between 18 to 30 years.

INTRODUCTION

Physical activity level (PAL) is defined as the total amount of time spent on activities that increase energy expenditure, such as daily life activities, work, and school activities, as well as recreational and sporting activities. (HOWLEY, 2001). According to WHO, physical activity imposes significant benefits to all age groups from infants less than 1 year to adults aged 65 years and above as it prevents many chronic illnesses such as diabetes, hypertension, heart diseases and several cancers despite improving psychosocial health and quality of life and well-being(WHO, 2020).The statement was also proven by a recent study conducted

in Australia among 2316 men with diabetes, which discovered that high-fit individuals had a 2.7 times lower rate of dying from cardiovascular disease than those who were less fit (Schwartz et al., 2019).

Nine out of ten studies conducted during the Covid-19 pandemic found that physical activity levels were significantly reduced. (López-Valenciano et al., 2021) Coronavirus disease is a worldwide pandemic that was discovered in December 2019. Due to the detrimental health consequences that this infection could impose, most of the countries with confirmed cases of covid-19 infections implemented certain measures of social distancing which includes closing of various sport facilities such as gym and recreational centres. (WHO, 2020). The lockdowns and social distancing have limited the opportunity for individuals to exercise outdoors, thereby forcing them to exercise at home, explaining some studies reporting a negative impact on exercise participation. (López-Valenciano et al., 2021) Five investigations showed a reduction of light/mild physical activity (walking) somewhere in the range of 32.5 and 365.5%, while seven examinations uncovered a decrease of high/vigorous physical activity in the range of 2.9 and 52.8% as compared to PA levels pre-lockdown. (Violant-Holz et al., 2020). Indeed, declines in PA have been linked to negative affect, anxiety, and decreased energy levels. In fact, studies have shown patients with type 1 and type 2 diabetes who engage in more sedentary behaviour suffer detrimental outcomes. (MacMillan et al., 2013).

Based on the references mentioned above, it is now clear that physical activity serves many benefits to our health and well-being. Although few articles concluded increase in physical activity level among students, majority studies have proposed a significant decline in the physical activity level among the university students. Moreover, apart from the fact that Standard Operating Procedures have been relaxed, Covid-19 is gradually approaching endemic phase in Malaysia. Therefore, this cross-sectional study aims to analyse the current trend of physical activity level of university students in UOC during the Covid-19 endemic and to determine the association of sociodemographic factors with physical activity among UOC students. Moreover, this study also focuses on comparing the physical activity level among different faculties which helps to identify whether there is poor level of physical activity among the students in UoC. Thus, this study will be a reference to evaluate whether appropriate interventions are needed to improve their physical activity level to avoid any negative consequences that it could impose among the students.

METHODOLOGIES

The study's objective is to evaluate the physical activity levels of University of Cyberjaya students in Sepang, utilizing a cross-sectional study approach. Data will be collected via surveys from students, serving as the primary data source, to comprehend their physical activity patterns. The study, spanning approximately 13 months from February 28, 2022, to April 6, 2023, will encompass students from 30 academic programs. Inclusion criteria entail being a University of Cyberjaya student aged 18-30, irrespective of gender, race, or physical activity status, provided they can adhere to instructions. Exclusion criteria encompass individuals under 18, those with physical limitations, and those contraindicated for physical activity. The sample size of 417 participants is established based on a 95% confidence interval, 5% significance level, and a 50% estimated population proportion, with adjustments for potential non-response. Ultimately, the study aims to assess and analyze the physical activity levels of these students to gain insights into their behaviors. With the ongoing pandemic and restrictions imposed to disallow mass gathering and to minimize contact, we will recruit our respondents via online questionnaire. Students at

University of Cyberjaya were contacted through social media groups such as WhatsApp, Email, Instagram and Facebook Groups as well as our saved contacts will be our main platforms to distribute the questionnaire. Before answering the questionnaire, respondents will ensure they fulfill the inclusion criteria.

DATA COLLECTION

In this research, a non-probability technique is employed for data collection through an online questionnaire. The questionnaire, distributed via the researchers' own social media platforms and contacts, utilizes Google Forms to automatically store respondents' answers. The research instrument involves a validated questionnaire encompassing sociodemographic information, general queries related to the ongoing pandemic, and the measurement of physical activity using the International Physical Activity Questionnaire – Short Form (IPAQ-SF). The sociodemographic section covers variables such as age, gender, ethnicity, nationality, education level, faculty, marital status, monthly household income, and BMI. The section on the pandemic explores respondents' experiences with pandemic safety measures and restrictions. Additionally, the International Physical Activity Questionnaire – Short Form assesses respondents' physical activity levels during the current pandemic situation. This instrument includes parameters of interest such as age, gender, BMI, area of residence, marital status, family income, course name, educational level, time of pandemic adoption, restriction level, smoking habit, and the IPAQ-SF score. By utilizing this comprehensive approach, the study aims to establish connections between sociodemographic factors, pandemic circumstances, and physical activity levels.

STATISTICAL ANALYSIS

Initially, the collected survey data will be structured into tables utilizing Microsoft Excel. Following this, the data will be input into the Statistical Package for the Social Sciences (SPSS) software to conduct statistical analyses. These analyses will focus on examining the existing pattern of physical activity levels among University of Cyberjaya (UoC) students, comparing these levels across various faculties at UoC, assessing the physical activity levels compared to the Covid-19 pandemic, and exploring the connection between sociodemographic factors and physical activity levels among UoC students. Descriptive statistics will be employed to investigate the current physical activity trends within the university student population. The association between sociodemographic factors and physical activity levels, as well as the comparison of physical activity levels among different faculties, will be examined using Chi-square tests. These methods will help unveil insights into the interplay between sociodemographic characteristics and the physical activity engagement of UoC students.

Results

Table 1

To identify the different socio-demographic factors studied among respondents.

Socio-demographics		Frequency (n)	Percentage %
Gender	Female	245	61
	Male	155	39
Age	Below 26	326	82
	26-30	54	14
	30-35	11	3

	Above 35	9	2
Ethnicity	Algerian	2	1
	Arab	2	1
	Bangladesh	1	0
	Chinese	114	29
	Indian	180	45
	Kadazan	1	0
	Malay	99	25
	Middle Eastern	1	0
Education Level	Degree	248	62
	Diploma	89	22
	Foundation	33	8
	Master	26	7
	PHD	4	1
Marital Status	Married	65	16
	Unmarried	331	83
	Divorce/Widow	4	1
Faculty	Accounting	30	8
	Biomedical Engineering Technology	8	2
	Business Administration	49	12
	MBBS	176	44
	Medical Assistant	11	3
	Others	21	5
	Pharmacy	44	11
	Psychology	61	15
Area	Urban	290	73
	Rural	110	28
Monthly Household Income	B40	145	36
	M40	181	45
	T20	74	19
BMI	Underweight	67	17
	Normal	242	61
	Overweight	91	23
Alcohol/Smoking Habits	Yes	128	32
	No	272	68

The purpose of the study was to examine the physical activity levels of students at the UoC, with a focus on various parameters. The demographics of the respondents were collected and compiled, providing information on the makeup of the sample population. In terms of gender distribution, there were 61% females and 39% males. The majority of participants (82%) were under the age of 26, with those between the ages of 26 and 30 accounting for 14%. A smaller fraction (3%) and 2% were between the ages of 30 and 35, respectively.

The ethnic diversity of the responses indicated a wide range of backgrounds where Indians (45%), Chinese (29%), and Malay (25%), were the most prevalent ethnic groups. Other ethnicities, including Algerians, Arabs, Bangladeshis, Kadazans, Middle Easterners, and "Others," made up a smaller part of the population.

In terms of educational status, 62% of respondents had bachelor's degrees, 22% held certificates, and 8% had completed foundation programs. Higher education was pursued by a smaller fraction of the population, with 7% earning a master's degree and 1% pursuing a PhD. Respondents' marital status revealed that the great majority (83%) were single, 16% were married, and 1% were divorced or widowed.

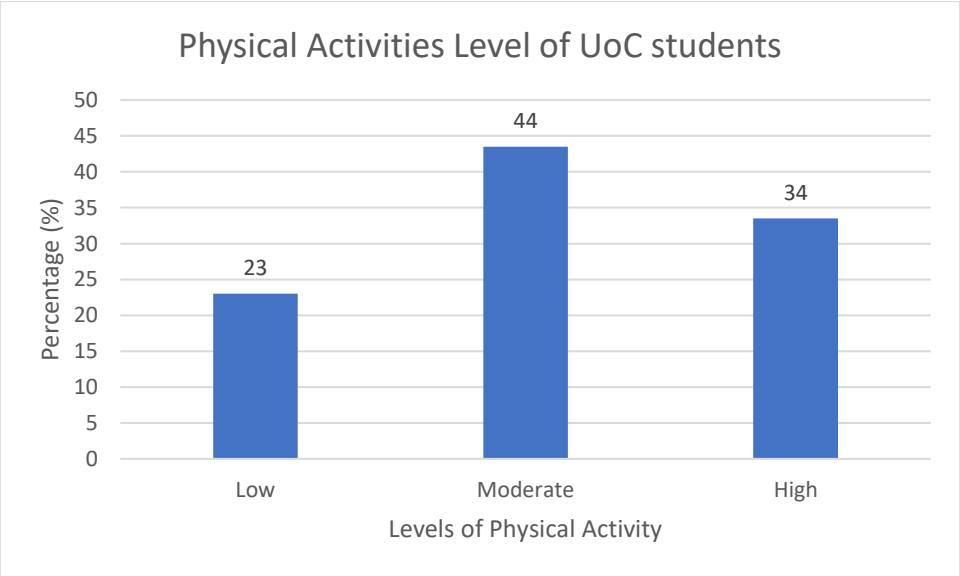
The MBBS (Medicine) program had the most responses (44%), followed by Psychology (15%), Business Administration (12%), Pharmacy (11%), and Accounting (8%). Many respondents (73%), with the remaining 28% living in rural regions, came from metropolitan areas.

The income distribution classified 45% of the participants as M40, indicating a middle-income range. In the meanwhile, 36% were categorized as B40 (low-income) and 19% as T20 (high-income).

Most responders (61%), according to BMI data, had a normal BMI, while 23% were overweight and 17% were underweight. In terms of drinking and smoking habits, 68% of respondents said they did not partake in these activities, while 32% said they did. Finally, the study provided valuable insights into the demographic makeup of the University of Cyberjaya students who participated in the study, including gender, age, ethnicity, education, marital status, faculty, residential area, income level, BMI, and alcohol/smoking habits. This information is crucial for comprehending the sample's characteristics and deriving relevant conclusions about their levels of physical activity.

Bar graph 1

Shows the Current trend of physical activity level of university students in UoC.



Most respondents, 51%, are classified as "Moderate" in terms of physical activity level. This suggests that a sizable proportion of the student population engages in moderate physical exercise.

The "Low" group accounted for 31% of answers, indicating that a significant proportion of students engage in relatively modest levels of physical exercise. In contrast, the "High" group includes 18% of responses, showing that a significant fraction of students is actively participating in greater levels of physical activity.

Table 2

To determine the physical activity level among university students compared to Covid-19 Pandemic based on Time of adoption to COVID-19 SOP and Restriction level.

Item		Frequency (n)	Percent (%)
Time of adoption to COVID-19 SOP	Social distancing less than 30 days	128	32
	Between 30 and 45 days	69	17
	Between 46 and 60 days	35	9
	Between 61 and 75 days	24	6
	Between 76 and 90 days	144	36
Restriction level	Completely adhered to the social distancing recommendation	158	40
	Did not adhere to the social distancing recommendation	7	2
	Maintained partial restriction leaving only for essential activities including work activities	94	24
	Maintained partial restriction leaving only for essential activities not related to work	140	35
	Maintained partial restriction leaving only for essential non work activities	1	0.3

The data in the table sheds light on the UoC respondents' adoption of COVID-19 pandemic-related Standard Operating Procedures (SOPs). The research focuses on two main aspects: the period of implementation of COVID-19 SOPs and the amount of adherence to social distancing suggestions. In terms of the period of adoption to COVID-19 SOPs, respondents' actions were classified depending on the length of their adoption. The biggest group, accounting for 36% of the sample, reported using social distancing measures between 76 and 90 days after the pandemic began. The next significant group, accounting for 32%, fell into the "less than 30 days" category. Following adoption periods exhibited decreasing frequencies: between 30 and 45 days (17%), 46 to 60 days (9%), and 61 to 75 days (6%).

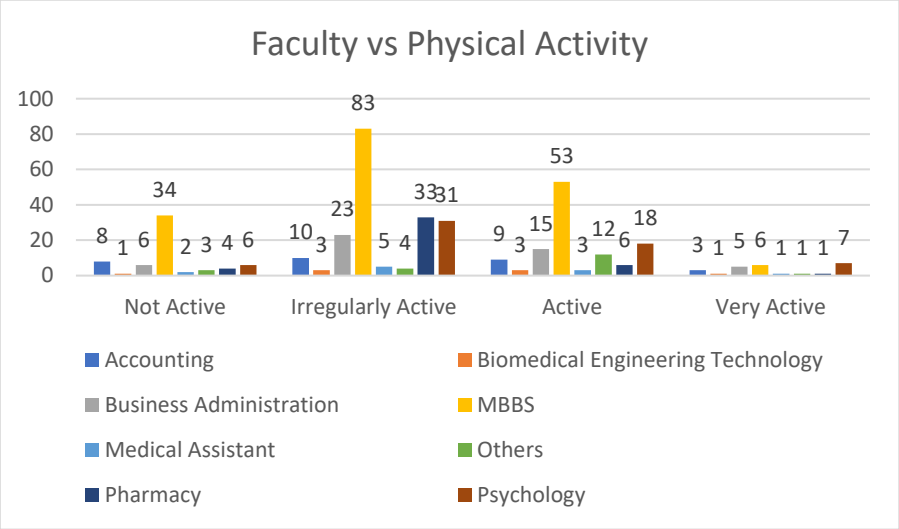
When the respondents' adherence to social distancing advice is examined, it is striking that the majority (40%) claimed that they had entirely followed these suggestions. A tiny percentage (2%) stated that they did not practice social distancing at all. Among those who kept limited limitations, 24% reported only leaving their homes for important tasks such as employment. A significantly greater proportion (35%)

maintained partial limits for necessary non-work activities, whereas an even lower proportion (0.3%) did so for essential work-related activities.

Finally, the data reveals that a high number of responders from the UoC followed COVID-19 SOPs throughout the first 90 days of the pandemic. The majority indicated at least some adherence to social distancing instructions, with a significant fraction entirely adhering. These data shed light on how individuals at the institution responded to and followed pandemic-related recommendations.

Bar graph 2

To compare physical activity level between students of different faculties at University of Cyberjaya (UoC).



To begin, while looking at the "Not Active" category, the MBBS (Medicine) faculty has the highest number at 53%. This shows that a sizable proportion of MBBS students do not engage in regular physical activity. Other faculties, on the other hand, have "Not Active" percentages ranging from 2% to 13%.

Second, the categories "Active" and "Very Active" indicate intriguing tendencies. The Psychology faculty distinguishes out with a comparatively high number of "Very Active" students (28%). This demonstrates that psychology students take a proactive approach to physical fitness. Furthermore, the Business Administration and MBBS faculties have significant proportions of "Very Active" students (20% and 24%, respectively).

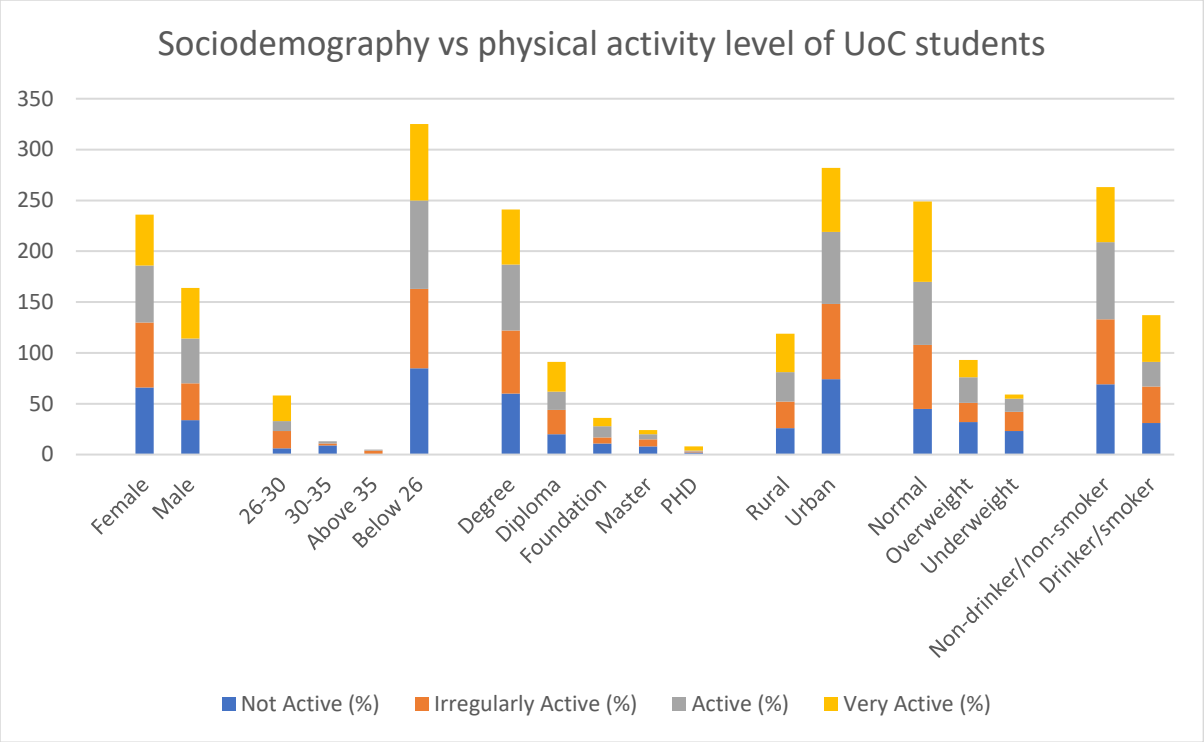
Finally, the "Irregularly Active" category highlights variation between faculties. The MBBS faculty has a greater number of students in this group (43%), indicating some but not consistent physical exercise. The Psychology faculty, on the other hand, stands out with a rather high number of "Irregularly Active" students (16%).

In summary, the findings represent variable levels of physical activity among UoC students from various faculties. While the MBBS faculty has a greater number of "Not Active" students, the Psychology faculty appears to be more proactive, as seen by their higher percentages of "Active" and "Very Active" students.

The findings give insights into physical activity trends across faculties, which might be useful in devising targeted interventions to promote healthier lives among students.

Table 3

Compares the socio-demographic factors and percentage of physical activity level of Uoc students.



Association between physical activity and selected socio-demographic characteristics.

To begin with, the data shows that both males and females exhibit comparable tendencies throughout exercise levels. The p-value for gender surpasses 0.05, indicating that the observed differences are not statistically significant, therefore gender may not have a large impact on pupils' physical activity levels.

The age category shows some fascinating insights. When compared to other age groups, students aged 26 to 30 had larger percentages in the "Irregularly Active" and "Very Active" categories. The p-value is less than 0.05, indicating that this difference is statistically significant. Older age groups (30-35 and over 35) have lower percentages of people who are "Active" or "Very Active."

According to research, students pursuing different degrees have comparable patterns of physical activity levels. The p-value is greater than 0.05, indicating that there is no substantial relationship between education level and physical activity.

When it comes to the Environment component, urban and rural pupils have a roughly similar distribution across activity levels. The p-value is more than 0.05, indicating that the environment may not have a substantial impact on students' physical activity behaviors.

The BMI contrast is very notable. Students with a normal BMI have larger percentages in the "Active" and "Very Active" categories, whereas students who are overweight or underweight have lower

percentages in these categories. The p-value is less than 0.05, indicating that this difference is statistically significant. This finding emphasizes the relationship between BMI and physical activity levels.

Finally, in terms of Alcohol/Smoking Habits, non-drinkers and non-smokers have greater percentages in the "Active" and "Very Active" categories, whereas those who drink or smoke have lower percentages. The p-value for this difference is less than 0.05, indicating that it is statistically significant. This suggests that drinking and smoking behaviors are linked to differences in physical activity levels.

Finally, the table successfully shows the interaction between selected socio-demographic factors and physical activity levels among students at the University of Cyberjaya. The p-values offered provide insight into the statistical significance of these connections. Based on these demographic parameters, this research provides useful information for developing targeted interventions to promote healthier lives and physical activity behaviors among the student population.

DISCUSSION

This cross-sectional study aimed to assess the physical activity levels among university students at UoC. The study found that the prevalence of physical activity level was 44%. A study conducted by Musharrafieh et al. in Lebanon, which aimed to evaluate physical activity among university students, reported a contradicting finding of 26.4% being physically active (Musharrafieh et al. 2008). However, this can be due to the difference of population size and sample size.

In the realm of adopting COVID-19 SOPs over time, the distribution yields intriguing patterns. The largest segment (36%) implemented social distancing measures between 76 and 90 days since the pandemic's inception, demonstrating proactive responsiveness to the evolving situation. Another substantial group (32%) promptly embraced these measures within the initial "less than 30 days," signaling swift action in the face of emerging health concerns.

Shifting our attention to adherence rates, a significant majority (40%) reported complete adherence to social distancing recommendations, illustrating a conscientious approach to public health directives. This robust adherence echoes responsible behavior documented in numerous studies during the pandemic. In stark contrast, a mere 2% admitted non-compliance, representing a minor segment of the population. Within those practicing limited restrictions, whether exclusively for essential tasks (24%), non-work activities (35%), or essential work-related activities (0.3%), a spectrum of compliance and adaptability is evident.

Interpreting potential ramifications for physical activity levels among university students requires embedding this data within the broader landscape of existing research. Findings from studies such as that by Wilson et al. (2022) emphasize the pandemic's negative impact on physical activity behaviors among college students, potentially corroborating the decreased physical activity tendencies observed here. Conversely, a study by Ammar et al. (2020) proposes the link between the adoption of pandemic-related measures and sedentary behaviors, suggesting a possible association with the trends seen in the adherence data of this study (Wilson et al. 2022; Ammar et al., 2020).

Moreover, the comparison of physical activity level between students of different faculties at University of Cyberjaya (UoC) was determined. Beginning with the "Not Active" category, the data reveals that the MBBS (Medicine) faculty exhibits the highest percentage, with 53% of students falling into this group. This indicates a significant portion of MBBS students do not regularly engage in physical activity. This aligns with studies such as the one by Lonsdale et al. (2017), which highlighted that students in rigorous programs like medicine might struggle to allocate time for physical activity due to academic demands.

Moving to the "Active" and "Very Active" categories, noteworthy patterns emerge. The Psychology faculty stands out with a substantial percentage (28%) of "Very Active" students, reflecting a proactive approach to physical fitness. This observation is consistent with findings from Mialich et al. (2014), who noted that students in fields related to health and wellness tend to exhibit higher physical activity levels.

The Business Administration and MBBS faculties also demonstrate significant proportions of "Very Active" students, with percentages of 20% and 24% respectively. This finding aligns with research by Hall et al. (2021), who indicated that students in faculties with access to fitness facilities or wellness programs are more likely to engage in higher levels of physical activity.

Lastly, the "Irregularly Active" category further highlights the variation between faculties. The MBBS faculty presents a greater number of students in this group (43%), indicating sporadic engagement in physical exercise. Similarly, the Psychology faculty has a relatively high number of "Irregularly Active" students (16%), which might be attributed to the unique demands of their academic program.

Association between physical activity and selected socio-demographic characteristics were researched. Starting with gender, the data reveals comparable exercise tendencies between males and females. The non-statistically significant p-value (greater than 0.05) indicates that gender may not substantially impact students' physical activity levels. This finding aligns with previous research, such as the study by Oyeyemi et al. (2016), which also found no significant gender-based differences in physical activity behaviors among university students.

Turning to the age category, intriguing insights emerge. Students aged 26 to 30 exhibit higher percentages in the "Irregularly Active" and "Very Active" categories, suggesting a potential age-related influence on physical activity. The statistically significant p-value (less than 0.05) supports this observation. This aligns with findings from a study by Dumith et al. (2011), which revealed that younger individuals tend to engage in higher levels of physical activity.

Examining education level, the data suggests comparable patterns of physical activity across different degrees. The non-statistically significant p-value (greater than 0.05) indicates that education level may not significantly impact students' physical activity behaviors. This aligns with the study by Haase et al. (2004), which explored physical activity variations across different countries and found that educational differences had minimal impact on activity levels.

Moving to the environment component, urban and rural students exhibit similar distributions of physical activity levels. The non-statistically significant p-value (greater than 0.05) implies that the environment

may not significantly influence students' physical activity behaviors. This is consistent with the research by Ding et al. (2013), which indicated that urbanization may not be a strong determinant of physical activity levels.

The BMI contrast reveals a notable relationship. Students with a normal BMI exhibit higher percentages in the "Active" and "Very Active" categories, while those who are overweight or underweight have lower percentages. The statistically significant p-value (less than 0.05) underscores the connection between BMI and physical activity levels. This aligns with the study by Singh et al. (2008), which demonstrated a strong association between BMI and physical activity behaviors among college students.

Lastly, examining Alcohol/Smoking Habits, non-drinkers and non-smokers show higher percentages in the "Active" and "Very Active" categories. Conversely, drinkers or smokers exhibit lower percentages. The statistically significant p-value (less than 0.05) underscores the impact of alcohol and smoking behaviors on physical activity levels. This aligns with the findings from a study by Paavola et al. (2004), which revealed negative associations between smoking, alcohol consumption, and physical activity.

CONCLUSION

This study investigated the complex relationship between socio-demographic characteristics and physical activity levels among students at the University of Cyberjaya (UoC). The data revealed a variety of patterns while revealing both similarities and differences amongst various groups. Most respondents (51%) were classified as having "Moderate" physical activity, implying active engagement in moderate exercise. In contrast, 31% of students were classified as "Low," meaning they engaged in lighter physical activity. In contrast, 18% belonged to the "High" category, showing that a significant subgroup habitually engages in greater levels of activity.

The research also revealed a considerable adherence to COVID-19 SOPs among UoC respondents, with a major fraction implementing social distancing measures within 76 to 90 days of the pandemic's commencement. Notably, 40% reported complete compliance with social distancing instructions, demonstrating the university's sensitivity to pandemic-related measures.

Furthermore, different degrees of physical activity were seen among UoC faculties. MBBS students were noticeably inactive, in contrast to Psychology students' proactive "Very Active" involvement. Business Administration and MBBS faculties had high "Very Active" percentages, but the "Irregularly Active" category showed significant variation, with Psychology students standing out for their very high rates.

In response to these findings, actions such as faculty-specific campaigns might be implemented to increase physical activity and promote healthy lives among University of Calgary students. While gender seemed to have no influence on activity, age did, with younger pupils being more active. BMI emerged as the most important predictor, outweighing the impact of education and other characteristics. These findings, which are backed by statistical analysis and earlier research, add to a more complete knowledge of the elements that influence students' physical activity. Tailored interventions targeting certain groups and taking individual characteristics into account should be explored to improve general well-being.

STRENGTH AND LIMITATIONS

The study's strengths include its thorough examination of numerous socio-demographic factors such as gender, age, education level, surroundings, BMI, and smoking/alcohol behaviors. The high sample size increases the statistical power and generalizability of the study, while the use of quantitative data and p-values allows for a clear and objective assessment of connections. Comparisons to earlier research help to validate interpretations. The limitations are since the current study did not analyze the obstacles to conducting physical activity, more research is required to understand the barriers that impede students from practicing physical exercise. Participants were asked to recollect physical activities they had done in the previous 7 days, which might contribute to memory bias and overestimation of physical activity owing to over reporting.

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