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Kalam Azad Isa
Nur Liyana Mohd Irwan
Nur Atikah Mohamed Kasim
Rozella Ab Razak
M. Adli Mohd Sidi

Faculty of Sports Science & Recreation, Universiti Teknologi MARA Cawangan Pahang, Jengka Campus 26400 Bandar Tun Abdul Razak, MALAYSIA

Corresponding Author

Kalam Azad Isa
Email: kalam_azad@uitm.edu.my
Faculty of Sports Science and Recreation,
Universiti Teknologi MARA, Cawangan Pahang.

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*Kalam Azad Isa[1], Nur Liyana Mohd Irwan[2], Nur Atikah Mohamed Kasim[3], Rozella Ab Razak &
M. Adli Mohd Sidi[4]*

[1234]*Faculty of Sports Science & Recreation, Universiti Teknologi MARA Cawangan Pahang,
Jengka Campus 26400 Bandar Tun Abdul Razak, MALAYSIA*

**kalam_azad@uitm.edu.my, yanairwan298@gmail.com, atikahmk@uitm.edu.my,
rozella@uitm.edu.my, adlisidi@uitm.edu.my*

ABSTRACT

The government of Malaysia has implemented a Movement Restriction Order (MCO) curfew on all citizens to prevent the Covid-19 pandemic from spreading. Studies have suggested that a long period of MCO will decrease overall weekly spending on energy for physical exercise in all age groups, ultimately promoting hypokinetic diseases. This study is interested in identifying the trend of physical activity behaviour changes during the Covid-19 MCO among university students. This study is also interested in comparing the mean score of physical activity level (inactive, minimum active, sufficient level) among samples. One hundred sixty-five (n=165) healthy samples age 19 to 23 years old currently enrolled as students from the Faculty of Sports Science and Recreation, University Teknologi Mara (FSR) answered the international physical activity questionnaire short form (IPAQ-SF) during the MCO period. Self-Reported Physical Activity Level has shown entirely contradicted from previous studies. 78.2% were at a sufficient level of physical activity; meanwhile, 20% were minimum, and 1.8% were reportedly inactive during the MCO period among FSR students. In addition, this study also found the differences of mean score in physical activity for sufficient level was (1438.78 SE=314.83), minimum active (-1268.65 SE=942.55), and inactive (-2707.43 SE=973.21). This study result showed that although, in restriction conditions in MCO, samples were still able to maintain their physical activity behaviour. The past physical activity practice can explain this phenomenon by these samples required throughout the lesson course, which has become a behaviour among these students.

Keywords: *Covid-19, Physical activity*

INTRODUCTION

Since early 2020, the world has been experiencing COVID-19, a pandemic that will lead to several health-threatening complications, including pneumonia, acute respiratory distress syndrome (ARDS), multiple organ failure, septic shock, and worse - death. The report showed that in six months of the COVID-19 pandemic spreading, the virus has claimed hundreds of thousands of lives, forcing the government in most countries, including Malaysia, to introduce Movement Control Orders (MCO) as a preventive step to minimalize the lethal spread of the disease (Nadzir et al., 2020). The enforcement of MCO has been seen to limit daily activities, including temporary orders to stop all sporting and recreation centres has led to limitations on physical activities among people. This problem has led to hypokinetic issues. This research predicts that people may be disinterested or not properly value the health benefits of maintaining physical activity during the lockdown period. Early research has suggested that movement quarantine drastically reduces physical activity, leading to unhealthy physical and mental changes that heavily affect one's quality of life (Hawryluck et al., 2004). Past researcher (Romero-Blanco et al., 2020) has indicated that if people were kept locked longer, they would start to jeopardise the benefits of physical activity, which in the long run promotes hypokinetic diseases. Besides, the last studies conducted in Italy that have found that movement quarantine leads to a significant decrease in overall weekly spending on energy for physical exercise in all age groups, particularly men, which negatively affects psychological health (Maugeri et al., 2020). Furthermore, other studies suspect that persistent population patterns over time may reflect changes in social distancing adherence that do not affect physical activity within the region (Tison Geoffrey H, 2020). During the lockdown period, physical exercise may have been a chance to pass the time or sedentary behaviour (Romero-Blanco et al., 2020). Prior research stated that exercise activity before a pandemic outbreak would likely affect the pandemic in terms of fitness activity and mood state. Specifically, the findings indicate that age, gender, and level of education played a role in changing exercise behaviour during the pandemic (Chang et al., 2020). Although some research was begun in western countries to determine the trend in physical activity behaviour due to the COVID-19 epidemic. Limited study on the direction of physical activity during the COVID-19 pandemic has been undertaken in Asian nations. Due to the scarcity of data, there are gaps in our understanding, which current research must fill. Thus, this study aims to determine the impact of the COVID-19 pandemic on the trend of physical activity behaviour among university students. This study is also proposed to utilise the Transtheoretical Model (TTM) as the lens for understanding exercise behaviour, such as physical activity's adoption and maintenance.

MATERIAL AND METHOD

Participants

A total of 165 college students from the Faculty of Sports and Recreation (69.7% male and 30.3% female) completed the survey. Using a convenience sampling method, participants were recruited from Universiti Teknologi Mara, Pahang Campus. Their ages ranged from 19 to 23 years. The study used a cross-sectional research design and received the approval of the UiTM Research Ethics Committee (REC).

Instrumentation

International of Physical Activity Questionnaire short form (IPAQ-SF) was used to identify the physical activity behaviour. The IPAQ was developed by a group of experts, the International Consensus Group, in 1998 to allow the surveillance of physical activities based on the global standard (Craig et al., 2003). The approach recommended by the IPAQ committee for cross-cultural adaptation includes a forward translation of the IPAQ and two independent experts for the back-translation into English. The questionnaire brings into question the number of days and the length of the last seven days of high-intensity physical activity, moderate-intensity physical activity, and walking. The last question tests every day the time when the subject sits or lays down. Physical activity is classified into three categories (Altun et al., 2005); Category I: Inactive ones: <600 MET min/week; category II: Minimum Active: 600-3000 MET min/week; category III: Sufficient level of PA for health: >3000 MET min/week. The results of Three Self-Report Instruments for Assessing Attainment of Physical Activity Guidelines in University Students showed that the questionnaire's validity indices are comparable to other self-reporting questionnaires and that the questionnaire's stability reliability was acceptable (Murphy et al., 2017). The level of physical activity is calculated by using the Metabolic Equivalent of Tasks (MET) method, and the overall MET is determined by the number of days and the amount of time each person spends high, medium and low on physical activity.

Statistical Analyses

A descriptive analysis of the respondent's demographic characteristics data was analysed; semester group, gender, age, academic program, and self-reported physical activity. A one-way ANOVA test has been conducted to determine whether there are significant differences between the physical activity levels. The p-value is set at 0.05 (α = < 0.05).

Results

The self-reported physical activity (Table 1) was reported by IPAQ-SF. In contrast, out of 165 respondents, 78.2% were reported as having sufficient physical activity, 20% were categorised as minimum active, and 1.8% were reportedly inactive. Respondents categorised as sufficient physical activity were more physically active in the 19–23 years age group, female (gender), and respondents majoring in diplomas. However, males have the highest number of respondents who are the least active and inactive in physical activity.

Table 1: Descriptive Cross Tab Analysis of the Gender-Based

Physical Activity Categories by IPAQ	Self-Reported Physical Activity		
	Male (n=115)	Female (n=50)	Total (n=165)
Inactive	2	1	3
Minimum active	24	9	33
Sufficient level of PA for health	89	40	129

METs minute per week

It was found that three respondents were measured have inactive (482.5±86.48), 33 came from minimum active (1751.15±772). 129 respondents were measured sufficient level of physical activity for health (3189.93±1774.08). The mean score of the physical activity level was classified as: <600 MET min/week = inactive ones, 600-3000 MET min/week = minimum active, and >3000 MET min/week = sufficient level of physical activity for health (Altun et al., 2005). Respondents who fit these criteria, which is ≥3 days for vigorous activity of 20 minutes per day, or ≥5 days for moderate-intensity and a walk of at least 30 minutes per day or>5 days for any combination of walking, moderate-intensity and vigorous-intensity activities achieving a ≥600 MET-minute/week, or Vigorous-intensity activity over at least three days and accumulating at least 1500 MET minutes/week or ≥ 7 days of any combination of walking, moderate-intensity and vigorous-intensity activities achieving a minimum of at least 3000 MET-minutes/week were considered as active. Inactive respondents would be those who did not fulfil the following criterion (Hagstromer et al., 2010).

Physical activity analysis

The distribution between the sufficient level of physical activity and minimum activity has a significant value (p= .000). However, there is also no significant value (p = .395) between inactive and minimum activity. Besides, there is also no significant value between a sufficient level of physical activity and inactive (p = .013). Sufficient physical activity levels have a higher mean differentiation between minimum active and inactive. Meanwhile, minimum active is a low mean differentiation between sufficient level and high mean differentiation between inactive. Finally, inactive has low mean differentiation between the sufficient level of physical activity and minimum active.

DISCUSSION

From IPAQ-SF that was given to the subjects; it was found that most of them were categorised as having an insufficient level of physical activity for health. This study shows that both genders have sufficient physical activity levels during the COVID-19 pandemic outbreak. Some of them have insufficient levels of physical activity. However, another researcher found a contradicting result

in which participants' physical activity levels were low, which examined university students' physical activity levels during the COVID-19 pandemic. (Ercan & Keklicek, 2020). Due to this study abroad and the test subject being university students, the researcher has undertaken this empirical work to conduct this study in Malaysia. Andrea's International Physical Activity Questionnaire (IPAQ) report in 2016 states that the minimum active subjects (600-3000 METs per minute per week) must be improved. Although their daily sedentary time is low, at less or equal to 4 hours, their low daily moderate to vigorous-intensity physical activity will negatively affect their current and future health. According to the health status, people who measured minimum activity should devote from 60 to 75 minutes daily to moderate-intensity physical activity or 30 to 35 minutes or to 35 minutes daily to vigorous physical activity, or 45 to 55 minutes daily to mixed intensity moderate to vigorous physical activity, to cancel out the negative effects that high sedentary time will have on current and future health. Meanwhile, inactive (<600 METs per minute per week) also need to improve their physical activity. Daily sedentary time to below 4 hours needs to be reduced, and increase moderate to vigorous-intensity physical activity time. 60 to 75 minutes daily should be devoted, or 30 to 35 minutes daily to vigorous physical activity, or 45 to 55 minutes daily to mixed intensity moderate to vigorous physical activity (IPAQ Research Committee, 2005). In line with the IPAQ-SF guidelines, as shown above, this study has found that most of the samples from the pool of sports science courses prefer to maintain their physical activity behaviour even during the lockdown period. This behaviour is believed to be due to the maintenance phase, as suggested in the Transtheoretical Theory (TTM). Furthermore, physical activity in the undertaking course is compulsory for all students. The past researcher assumed that they also followed the recommendations throughout COVID-19 confinement despite the loss of physical activity (Cortis et al., 2020). In a meta-analysis published between 1996 and 2009, the transtheoretical theory was a leading framework of effective behavioural and physical activity (Antikainen & Ellis, 2011; Krebs, Prochaska & Rossil, 2010). Past studies also stated that the positive impacts of the use of this model are consistent. The preparations and physical activity stages were followed after three months by a high rate of people in the intervention group. Six months after the intervention, the trend was maintained. Findings suggest that the TTM-based intervention could be beneficial in bringing people to more productive lifestyles (Dallow & Enderson, 2003). However, some studies have found that the quarantine period has lowered physical activity behaviour. Previous research found that the participant's physical activity levels were low, and they investigated the physical activity levels of university students during the COVID-19 pandemic (Ercan & Keklicek, 2020). Along with male and female adults throughout the restrictions, two comparable studies examined physical activity levels in active and inactive individuals. The researchers studied the physical activity level in the active Italian population before and throughout the last seven days of the COVID-19 quarantine. It was reported that there was a decrease in the number of highly (26%) active individuals, and the number of low (19%) and moderately (7%) active participants increased (Giustino et al., 2020). Besides, previous studies investigated the impact of physical activity levels and well-being restrictions on the active Canadian population. This study showed that 22% of the people included decreased physical activity, and 37% did not affect physical activity at all (Lesser & Nienhuis, 2020). The positive impacts of using this theory are consistent with Opender, Dallow, Kirk and Speck's studies. The preparations and action stages were followed after three months by a high rate of people in the intervention group. The trend was maintained six months after the intervention, and findings suggest that the transtheoretical theory-based intervention could be beneficial in bringing people to more productive lifestyles. Meanwhile, previous studies (Osipov

et al., 2021) claimed that a part of their sample retained a significantly higher overall physical activity level despite a consistent reduction in physical activity level during the COVID-19 pandemic outbreak. This study result and a previous study have shown different physical activity behaviour, which requires further investigation. This study suggests the differences in courses undertaken by students will likely influence the behaviour of the physical activity.

CONCLUSION AND RECOMMENDATION

In a recap of the study that the researcher conducted, the subjects were measured using International Physical Activity Questionnaire Short Form (IPAQ-SF) to identify the level of physical activity for both genders. It is found that the level of percentage in physical activity has significant differences between age, gender, and academic groups due to the differences in a large number of respondents. However, there is no significant difference between the mean MET score among the Sufficient Level of Physical Activity for Health, Minimum Active, and Inactive. We can conclude that this study has shown the differences between physical activity levels during the current lockdown with previous studies. According to this study, males have the highest number of sufficient levels of physical activity, while this group also has the highest number of minimum active and inactive physical activity. However, sports science students still maintained their physical activity level during the isolation period despite having a factor that caused them to need to maintain fitness. To sum up, most sports science students have sufficient levels of physical activity for health during the COVID-19 pandemic outbreak. Promoting physical activity during lockdowns should be targeted not just at passive people but also at people with physically active. Physical activity is suggested during the COVID-19 pandemic due to its multiple benefits on physical and mental health. It is suggested to promote digital and physical activity such as workout applications, online video fitness or physical training. Besides, specific recommendations to address home-based training during this time are highly needed. Further studies should examine the comparisons between courses undertaken by university students to determine physical activity behaviour. Also, future studies should reconsider the post-lockdown survey to provide insights into the resumption of structured and unstructured physical activity as well as on the long-term effects on physical activity and sedentary behaviour (Luciano et al., 2020).

LIMITATION

Surveys collect data at a single point in time is difficult to measure changes in the same unless two or more surveys are done at different points in time. This study comes with limitations. Surveys collect data at a single point in time is difficult to measure changes in the sample unless two or more surveys are done at different points. Previous researchers (Lauderdale et al., 2008; Lee et al., 2011) claimed self-reported physical activity, sedentary behaviour, and sleep are less reliable than device-based measures and may have led to under-or overestimating these parameters. Hopefully, there's timeline data collected.

Authors' Contribution
Data analysis was done by KAI, NLMI, NAMK, RAZ, and MAMS contributed to the discussion and interpretation of the results. KAI and NLMI wrote the manuscript. NAMK, RAZ, and MAMS carried out the measurements. All the authors reviewed the final manuscript.

Conflict of Interest
The authors declare that they have no conflict of interest.

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