

Influence of Physical Activity on Mental Health Among Undergraduate Students in International

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ABSTRACT

Background: Declaration of movement control order (MCO) during pandemic of COVID-19 has inflicted challenges in maintaining mental health of world population, including university students. Being inactive is among the reasons for mental disturbance among university students during the MCO period. Physically active has been demonstrated as a coping mechanism to improve mental health. The lifting of MCO supposed to recover the mental health status among the university students as they can return to have an active life. However, the status of mental health and level of physical activity among university students after the MCO period is not well reported. This study aimed to identify the mental health status and level of physical activity among undergraduate students in International Islamic University Malaysia Kuantan Campus and the association between the mental health status and level of physical activity.

Method: A cross-sectional study was conducted among 243 undergraduate students in International Islamic University Malaysia Kuantan Campus who were recruited using stratified random sampling. The questionnaires used to collect data consisted of three parts which were socio-demographical data, DASS-21 questionnaire and IPAQ-SF questionnaire. The data on socio-demographical characteristics were presented in frequency and percentage. The mental health status and level of physical activity were identified by determining the mean score of each parameter. The association between the mental health status and level of physical activity were analysed using Chi-square test.

Result: The study found that most respondents have normal level of depression (55.1%), anxiety (42.8%) and stress (65.4%). Most respondents also practiced vigorous physical activity (47.3%). However, no significant association were found between depression ($p=0.183$), anxiety ($p=0.438$), stress ($p=0.196$) and physical activity.

Conclusion: The study found that mental health status among undergraduate students in International Islamic University Malaysia Kuantan Campus after MCO period was at normal level and living in active lifestyle, though no significant association were found between these parameters.

Keywords: Physical activity, Mental health, Movement control order, Knowledge, Attitude, Practice.

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INTRODUCTION

The pandemic of coronavirus disease 2019 (COVID-19) has change lifestyle of world population dramatically due to implementation of movement control order (MCO). This unprecedented situation has imposed challenges to people on being physically active due to social isolation to cope with the outbreak of disease (1 & 2). Previous studies have reported that enforcement of movement control order have increase physical inactivity during COVID-19 pandemic in several countries, indicating difficulty to stay physically active during this period (3 & 4). Although the social isolation is necessary to slow the spread of COVID-19, people need to engage with appropriate physical activity to stay fit and healthy physically and mentally (5).

Since the first COVID-19 case has been reported in December 2019, the disease continued to emerge and represent a serious issue to public health that affected most aspects in human life (5). Among the public health issue that significantly affected by the pandemic is mental health, where university students were not excepted from experiencing the issue (6). The prevalence of depression, anxiety and stress is high among the general population in many countries during the COVID-19 pandemic, including Malaysia (7 - 9). Tee et al. (9) highlighted that depression, anxiety, and stress were considered as crucial indicators for mental health in community, including among university student population. Thus, it is important to keep the level of mental health among university student population at par as their mental status is necessary for their educational performance.

Previous studies have reported the potential of physical activity as coping mechanism to deal with depression, anxiety and stress among college and university students during COVID-19 pandemic (2, 10 & 11). For instance, Ghrouz et al. (10) showed that Indian college students with moderate and high levels physical activity were reported to have significantly lower anxiety and depression scores than their counterparts with a low level of physical activity. Similar results were found by Rogowska et al. (2) on anxiety and depression among university students in Ukraine in relation to level of physical activity. Another

study by Schultchen et al. (11) found that even low and moderate physical activity were also can significantly lower the level of stress level. However, the study that reports the mental health status among university students in relation to physical activity after MCO period is lacking. This information is important in identifying the coping mechanisms in improving the mental health status among university students during recovery period after MCO. Therefore, the aim for this study is to identify the level of depression, anxiety and stress among undergraduate students in International Islamic University Malaysia (IIUM) of Kuantan Campus and their association with the level of physical activity after MCO period.

METHODS

This study was a quantitative cross-sectional study. The study has been approved by IIUM Research Ethic Committee (IREC 2022-KON/12). The sample size calculation using Raosoft® Sample Size Calculator with 5% margin error, 95% confidence interval, 50% response distribution and 3,645 population size resulted in 346 sample size of students. The students who were full time undergraduate students in IIUM Kuantan Campus, active status during the study period and do not have mental health problem were invited to join the study. The participants were recruited using stratified random sampling from April to June 2022.

Each participant has been briefed about the study, including confidentiality of participant information, using information sheet prior to obtaining the consent from them. Information of the participants were kept confidentially, where only the researchers who involved directly with the study were allowed to access to the participant information. Label were given to each participant as replacement for their name for publication of results purpose. Besides, the participants have the right to refuse participation and withdraw consent at any time.

The study used an online self-administered questionnaire which has three parts. Part A was socio-demographic data which consisted of age, gender, faculty (kulliyah), year of study, cumulative grade point average (CGPA) and

history of mental illness. Part B was questionnaire about level of emotional states that consists of 21 questions using Depression, Anxiety and Stress Scale - 21 (DASS-21) questionnaires. Meanwhile, part C was questionnaire about physical activity level that consist of 13 questions using International Physical Activity Questionnaire - Short Form (IPAQ-SF) questionnaires.

Statistical Analysis

Data were analysed using IBM Statistical Package for Social Science software version 26.0. Descriptive statistics was used to measure the frequency and percentage of socio-demographic, level of emotional states (depression, anxiety and stress) and intensity of physical activity data. Chi-square test was used as differential statistics to measure the association between emotional states and PA, where p-value less than 0.05 was considered as statistically significant.

RESULTS

Socio-demographic characteristics of respondents

The study able to recruit 243 undergraduate students in IIUM Kuantan Campus with 70% response rate. Based on **Table 1**, majority of the respondents were female (61.7%) with age of 23 - 24 years old (49.8%). Academically, the respondents were year 4 students (44%) who came from Allied Health Sciences program (22.6%) and most of them have CGPA between 3.5 - 4.0 (50.6%). Moreover, all the participants were not having any history of mental illness.

Level of depression, anxiety and stress among undergraduate students of IIUM Kuantan Campus.

Table 2 showed that majority of the respondents scored normal level for depression, anxiety, and stress, which were 55.1%, 42.8% and 65.4%, respectively.

Level of physical activity among undergraduate students of IIUM Kuantan Campus.

Based on the **Table 3**, majority of the respondents practicing vigorous intensity of

physical activity (47.3%), followed by moderate (33.7%) and low intensity (18.9%).

Table 1: Socio-demographic characteristics of respondents (n=243).

Variables	Frequency (N)	Percentage (%)
Age		
< 20	13	5.3
21-22	100	41.2
23-24	121	49.8
> 24	9	3.7
Gender		
Male	93	38.3
Female	150	61.7
Kulliyyah		
Allied Health Sciences	55	22.6
Dentistry	29	11.9
Medicine	34	14.0
Nursing	42	17.3
Pharmacy	43	17.7
Sciences	40	16.5
Year of study		
1	17	7.0
2	36	14.8
3	74	30.5
4	107	44.0
5	9	3.7
CGPA		
2.00 - 2.49	2	0.8
2.50 - 2.99	14	5.8
3.00 - 3.49	104	42.8
3.50 - 4.00	123	50.6
History of mental illness?		
Yes	0	0
No	243	100.0

Association between physical activity with depression, anxiety and stress among undergraduate students of IIUM Kuantan Campus

Table 4 showed that there is no significant association between physical activity with depression, anxiety and stress ($p > 0.05$).

DISCUSSION

Mental Health Status Among IIUM Kuantan Campus Undergraduate Students After MCO Period

COVID-19 has imposed mental threat to overall world population, including university students. Previous studies have reported mild to severe level of depression, anxiety and stress

Table 2: Frequency and percentage on level of depression, anxiety and stress among undergraduate students of IIUM Kuantan Campus

Variables	Frequency (N)	Percentage (%)
Depression		
Normal	134	55.1
Mild	33	13.6
Moderate	39	16.0
Severe	19	7.8
Extremely severe	18	7.4
Anxiety		
Normal	104	42.8
Mild	17	7.0
Moderate	58	23.9
Severe	25	10.3
Extremely severe	39	16.0
Stress		
Normal	159	65.4
Mild	31	12.8
Moderate	31	12.8
Severe	15	6.2
Extremely severe	7	2.9

Table 3: Level of physical activity of respondents

Level of physical activity	Frequency (N)	Percentage (%)
Low	46	18.9
Moderate	82	33.7
Vigorous	115	47.3

Table 4: Level of physical activity of respondents

Independent variable	Dependent variables	p-value
Physical activity	Depression	0.183
	Anxiety	0.438
	Stress	0.196

among university students across the world, including Malaysia (12 - 15). DASS-21 is among the questionnaire that commonly used by researchers to measure depression, anxiety and stress in a population. The DASS-21 can provide insight into the existence and influence of stress symptoms as well as potential environmental factors on the general emotional status of the respondents. Its validity is comparable to other specific depression and anxiety questionnaires.

The implementation of the first MCO in Malaysia was generally found to be effective in curbing the spread of COVID-19. However, less is known on its effect on the psychological

outcomes of university students (16). Different studies reported different prevalence of depression, anxiety and stress among university students during MCO in Malaysia, with average prevalence were reported between 20% to 40% of study population (16 - 18). A study by Faez et al. (19) reported the higher prevalence of depression, anxiety and stress among university students during MCO in Malaysia, whereby 65% of the students were reported with depressive symptoms, 67.21% with anxiety symptoms and 59.29% with stress symptoms. At the end of MCO period, Woon et al. (20) reported that the prevalence of depression, anxiety and stress among the university students in Malaysia were 36.4%, 36.7% and 42.4%, respectively. In the current study, 44.9% of the students reported to have depressive symptoms, 57.2% reported to have anxiety symptoms and 34.6% of them reported to have stress symptoms. However, comparing the result of mental status of university students across these studies need a few considerations, such as level of studies (undergraduate or postgraduate) and type of study programs (science and technology or non-science and technology) that may affect the adaptation process among students from traditional teaching and learning to online mode. These results preliminarily showed an improvement in mental health status among university students after MCO period, particularly depression and stress.

Physical Activity Level Among IIUM Kuantan Campus Undergraduate Students After MCO Period

IPAQ-SF is a standardized and culturally adaptable measurement tool for physical activity in different cultural areas worldwide. It is a self-report questionnaire that has been widely used in several surveillance programmes internationally to assess physical activity (21). During the MCO period, staying at home may reduce physical activity among peoples and increased risk for chronic health conditions, including mental health (22 & 23). Similar effect has been experienced by the university students that partly contributed by changes in mode of teaching and learning from face-to-face to online mode (24). Analysis in the current study reported a positive outcome on physical activity among undergraduate students in IIUM, which indicated by higher

participation of the students in moderate and vigorous intensity of physical activity as compared to low intensity. In IPAQ-SF, moderate and vigorous intensity of physical activity are mostly outdoor activities, while low intensity physical activity are mostly indoor activities. Based on this finding, the uplifting of MCO has encourage the university students to involve in outdoor activities that are more intense as compared to indoor activities. The fact that active physical activity could improve mental health status, the finding in the current study on high intensity level of physical activity could influence the mental status among the students (2, 10 & 11).

The Association Between Physical Activity Level and Mental Health Status Among IIUM Kuantan Campus Undergraduate Students

In the current study, there was no significant association between level of physical activity and mental health status of IIUM Kuantan Campus undergraduate students. Contradictorily, the previous studies found the significant association between level of physical activity and mental health status among university students (2, 10 & 11). The non-significant association in the current study could be contributed by lower sample size than the calculated sample size, where the response rate in this study was only 70%. Statistically significant result is contributed by statistical power and statistical power depends on sample size. Thus, the inability to achieve required sample size could contribute to the non-significant results in the current study (25).

However, the previous studies that reported significant association between physical activity and mental health status on depression, anxiety and stress may give some insight for the findings in the current study, though not statistically significant. For association between physical activity and depression, the previous studies reported that the high level of physical activity was significantly associated with less depression symptoms (26 - 30). Meanwhile, other studies showed that decreased in physical activity during the COVID-19 pandemic was significantly associated with more depression symptoms (27, 30, 31 & 32). For association between physical activity and anxiety, the previous studies revealed that the high level of physical activity was significantly

associated with less anxiety symptoms (28). Meanwhile, Chen et al. (22) and Deng et al. (27) showed that decreased in physical activity was significantly associated with more anxiety symptoms. Lastly, the significant association between physical activity and stress has been shown by Lipert et al. (33) where the high level of physical activity significantly reduced the level of stress. Thus, the current study did not have adequate evidence to reject the null hypothesis like the other previous studies that may be due to inadequate sample size.

A few limitations have been identified in the current study. The current study was not able to achieve the calculated sample size, where the response rate was only 70%. The inadequate sample size affected the sample size determined for each kulliyah. The sampling method used in the current study was stratified random sampling. So, each kulliyah were divided to the size that proportionate to the number of students in the kulliyah. Even though the proportion of students from each kulliyah were seems fairly distributed, this number was not achieving the sample size that supposedly to be recruited. Thus, it may affect the reliability and accuracy of the current study. Lastly, the period for data collection in the current study was limited. A longer period may increase the chance to completely recruit the respondents according to the calculated sample size.

CONCLUSION

The current study was successfully achieved the study objectives which were to determine the level of mental health status, which were depression, anxiety, stress, and physical activity among undergraduate students in IIUM Kuantan Campus after MCO period and the association between each of these parameters. The analysis on level of depression, anxiety and stress among undergraduate students in IIUM Kuantan Campus were at normal level. Meanwhile, the analysis on level of physical activity among these students revealed that most of them involved in vigorous physical activity, followed by moderate level and lastly low level. However, there were no significant association exist between physical activity and mental health status. So, the current study was not able reject the null hypothesis of study. The result of this

study indicates the importance of practicing high level of physical activity to have a better mental health status. Therefore, it is suggested that the university authorities could monitor the mental health status by conducting a survey among students on a regular basis. Motivating the students to increase the level of physical activity could be promoted as a coping mechanism to improve the mental and physical well-being of all students.

CONFLICT OF INTEREST

The authors declared that there is no conflict of interest.

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The current study has been approved by IIUM Research Ethic Committee (IREC 2022-KON/12). The respondent's participation was on voluntary basis, where they were briefed about the study before giving the consent and given right to withdraw from the study at any time. Their information was kept confidentially and not revealed to public.

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