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Evaluation of Physical Activity Profile and Mood State during Ramadan: A study on Sports students

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ABSTRACT

This study aims to evaluate the relationship between physical activity and mood stress during the month of Ramadan. A total of 26 college students participated in this study a trial of physical activity during Ramadan. Physical activity profiles were measured using the International Physical Activity Questionnaire (IPAQ) and mood profiles using the Profile of Mood States (POMS) in the first and fourth weeks of Ramadan. The results of the analysis showed that sports students tended to maintain a constant level of physical activity throughout the month of Ramadan, absence of significant differences in high-intensity physical activity (vigorous) and moderate between the first and fourth weeks. Although low-intensity physical activity decreased, this change was not significant. In the measurement of POMS components, there was a decrease in the dimensions of depression (DEP), fatigue (FAT), confusion (CON), and vigour (VIG), while the dimensions of tension (TEN) and anger (ANG) increased. In addition, no relationship was found between the IPAQ and POMS profiles in the fourth week, except for the relationship between low-intensity physical activity and Total Mood Disturbance (TMD) scores, which showed a significant positive correlation ($r = 0.420$, $p = 0.033$). In conclusion, although physical activity tends to be stable during the month of Ramadan, a decrease in low-intensity activity can affect mood stress, indicating the need for managing exercise intensity to maintain psychological well-being. The implications of this study are important for fasting individuals to understand the impact of physical exercise on mental health and consider the appropriate exercise intensity during fasting.

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A. Conception and design of the study;
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INTRODUCTION

Physical fitness is a crucial factor for someone to be able to maintain their performance and even health (Warburton et al., 2006). With an optimal level of fitness, not only does it keep someone productive but it will also prevent premature fatigue which will later hurt their performance (Knapik, 2015). Increasing fitness is related to how someone does physical activity regularly and in a programmed manner. Various types of physical exercise have different results for achieving a person's fitness (Schmidt et al., 2017).

The level of physical activity is divided into 3 categories such as low, moderate and vigorous, these three categories describe how hard a person is to carry out physical activity (Allen & Vella, 2015; Marin et al., 2020). Monitoring physical activity usually uses The International Physical Activity Questionnaire (IPAQ), which will later classify the physical activity carried out by a person within a period of 1 week (Roberts-Lewis et al., 2022). This monitoring is important so that a person knows how much they have been physically active in one week (Mehta et al., 2018).

In addition, knowing the level of physical activity performed will provide an overview of whether the body has experienced an adaptation to the level of challenge of the load given or not (WHO, 2016). Experiencing this load challenge will later have the potential to increase fitness for a person (Chaves et al., 2024; Duncan & Craig Liebenson, 2018). Interestingly, this increase also has the potential to increase mood stress for the person, this increase in mood stress is based on an increase in the hormone cortisol which will later trigger stress in someone who does physical exercise with moderate intensity for a long period and high (Stults-Kolehmainen & Sinha, 2014).

Furthermore, people often use physical and mental stress as an excuse to avoid physical activity (Bendau et al., 2024; Yoon et al., 2019). The urgency of this study is to evaluate the physical activity of adolescents during the month of Ramadan. The selection of the month of Ramadan is based on the low potential for someone to do physical activity due to limited energy sources and also the acceleration of increasing stress mood which is very fast due to limited nutritional sources received by the body (Jandali et al., 2024). The purpose of this study is to evaluate the impact of physical exercise on stress mood that arises in someone who does physical exercise during the month of Ramadan, which is expected from the results of this study, the community will understand the risk factors that occur when doing physical activity during the month of Ramadan, especially on stress mood factors. The novelty of this study lies in the approach that examines the relationship between the intensity of physical exercise and stress response in adolescents during the month of Ramadan, which is a topic that is rarely studied specifically in the context of fasting.

METHODS

This study uses a descriptive quantitative design with a pilot project. 26 samples who are students participated in this study, data were taken when students were fasting during Ramadan from March 1, 2025 - to March 30, 2025. The research instruments include the International Physical Activity Questionnaire (IPAQ) questionnaire to measure physical activity levels, and the Profile of Mood States (POMS) with 65 statements that are randomly divided in assessing mood dimensions: Tension (TEN), Depression (DEP), Angry (ANG), Vigor (VIG), Fatigue (FAT) and Confusion (CON). For each item, respondents provide a scale of 0-4 (0 = not at all to 4 = very): then the calculation of total Mood Disturbance (TMD) is carried out using the formula TMD = (TEN + DEP + ANG + FAT + CON) -VIG.

Table 1.
Profile Student

No.	Profile	n	Mean±St.Dev	Min	Max
1	Age (Years)	26	19,04±0,87	18	22
2	Body Weight (Kg)	26	63,25±13,74	47	103
3	Body High (Cm)	26	166,04±6,17	153	179
4	Body Mass Indeks (BMI)	26	22.87±4.44	17,26	36,06

Statistical tests in this study used descriptive tests, data normality tests, difference tests and correlation tests. Difference tests were conducted to compare physical activity values (IPAQ results) and POMS scores between the first and fourth weeks of Ramadan. If the data were normally distributed, the paired t-test was used; otherwise, the non-parametric test (Wilcoxon) was applied. In addition, bivariate correlation analysis (Pearson or Spearman test) was conducted to test the relationship between physical activity levels and POMS scores. The results of statistical tests were evaluated at a significance level of $p<0.05$ to determine significant differences and associations. All statistical tests used SPSS 29 software and visualization of statistical test results used Graph Pad Prism 10.

RESULTS AND DISCUSSION

Table 2.
Profile of Physical Activity Based on Ipaq

No	Physical Activity Level	Weeks	n	Mean	St.Dev	P-Value
1	Vigorous	Weeks-1	26	601,539	607,419	<0,001
2	(MET-minutes/week)	Weeks-4	26	652,308	603,644	0,003
3	Moderat	Weeks-1	26	422,308	411,449	<0,001
4	(MET-minutes/week)	Weeks-4	26	473,077	407,134	<0,001
5	Low	Weeks-1	26	306,519	340,849	<0,001
6	(MET-minutes/week)	Weeks-4	26	244,327	307,167	<0,001
7	Total Mets	Weeks-1	26	1330,385	911,962	0,002
8	(MET-minutes/week)	Weeks-4	26	1369,731	916,285	0,011

The results of the data normality test P value < 0.05 means that the data is not normally distributed.

Table 2 shows that there was a change in the physical activity profile based on the IPAQ in the first and fourth weeks in 26 respondents, in particular, there was an increase in physical activity at the vigorous and moderate levels, interestingly respondents reduced their low-level activity in the fourth week.

Table 3.
Mood States Profile

No	Mood Stress	Weeks	n	Mean	St.Dev	P-Value
1	TEN	Weeks-1	26	3,269	3,811	<0,001
		Weeks-4	26	3,308	4,212	<0,001
2	DEP	Weeks-1	26	3,269	3,539	<0,001
		Weeks-4	26	3,115	3,548	<0,001
3	ANG	Weeks-1	26	2,615	3,226	<0,001
		Weeks-4	26	2,923	3,999	<0,001

No	Mood Stress	Weeks	n	Mean	St.Dev	P-Value
4	FAT	Weeks-1	26	5,500	4,375	0,052
		Weeks-4	26	5,192	4,543	0,007
5	CON	Weeks-1	26	4,269	3,562	0,007
		Weeks-4	26	3,808	4,186	<0,001
6	VIG	Weeks-1	26	13,769	4,650	0,036
		Weeks-4	26	13,039	4,812	0,228
7	TMD	Weeks-1	26	5,154	16,632	0,039
		Weeks-4	26	5,308	18,330	0,041

The results of the data normality test P value < 0.05 means that the data is not normally distributed.

Table 3 shows changes in mood stress profiles based on POMS in the first week and the fourth week, with 26 respondents. The results of the analysis showed a decrease in several mood dimensions such as depression, fatigue, and confusion, although several dimensions such as tension, anger, and enthusiasm showed increasing changes based on the mean average.

Table 4.
Differences in Physical Activity Profiles Week One and Four

No	Physical Activity Level	Weeks	Z Score	Sig.
1	Vigorous (MET-minutes/week)	Weeks-1 Weeks-4	-0,768	0,433
2	Moderat (MET-minutes/week)	Weeks-1 Weeks-4	-0,480	0,632
3	Low (MET-minutes/week)	Weeks-1 Weeks-4	-1,106	0,269
4	Total Mets (MET-minutes/week)	Weeks-1 Weeks-4	-0,229	0,819

Table 4 shows the differences in physical activity profiles between the first and fourth weeks based on Z Score and significance (p-value). The results of the analysis showed that there were no significant differences in physical activity levels (vigorous, moderate, low, and total METs) between the first and fourth weeks, with all p-values greater than 0.05.

Table 5.
Differences in Mood Stress Profiles Week One and Four

No	Mood Stress	Weeks	Z Score	Sig.
1	TEN	Weeks-1 Weeks-4	-0,169	0,866
2	DEP	Weeks-1 Weeks-4	-0,314	0,754
3	ANG	Weeks-1 Weeks-4	-0,361	0,718
4	FAT	Weeks-1 Weeks-4	-0,733	0,464
5	CON	Weeks-1 Weeks-4	-0,941	0,361
6	VIG	Weeks-1 Weeks-4	-1,087	0,277
7	TMD	Weeks-1 Weeks-4	-0,560	0,575

Table 5 shows the differences in mood stress profiles between the first and fourth weeks based on Z Score and significance (p-value). The results of the analysis showed that there were no significant differences in mood dimensions such as tension, depression, anger, fatigue, confusion, vigour, and total mood disturbance (TMD) between the first and fourth weeks, with all p-values greater than 0.05.

Table 6.

Relationship Between Physical Activity Profile and TMD (POMS)

Physical Activity Level	Weeks	TMD Weeks-1		TMD Weeks-4	
		Correlation	Sig.	Correlation	Sig.
Vigorous	Weeks-1	0,115	0,576		
	Weeks-4			-0,165	0,42
Moderat	Weeks-1	0,103	0,617		
	Weeks-4			0,025	0,905
Low	Weeks-1	-0,072	0,727		
	Weeks-4			0,420*	0,033

Table 6 shows the relationship between physical activity levels and Total Mood Disturbance (TMD) in the first and fourth weeks. The results of the correlation analysis showed no significant relationship between high-intensity physical activity (vigorous) and moderate physical activity with TMD, but there was a significant positive correlation between low-intensity physical activity and TMD in the fourth week ($r = 0.420$, $p = 0.033$).

The results of this study showed no significant difference in total physical activity (IPAQ) for all categories or mood disturbance scores (POMS) in week 1 and week 4 during the implementation of physical activity during the fasting month of Ramadan. These results indicate that the pattern of physical activity to the psychological control of respondents tends to be relatively stable throughout the fasting month of Ramadan. These results contrast with the results of the study (Elsahoryi et al., 2025) which shows a decrease in physical activity levels during Ramadan. This difference occurs due to differences in the profiles of students involved in this study, in this study, the students involved were students who actively exercise regularly throughout the week. So they are able to organize training strategies, training intensity to rest patterns where this combination will have a small impact on changes in performance during the month of Ramadan (Kirkendall et al., 2012).

In line with physical activity, the results of the Total Mood Disturbance (TMD) score assessment on the POMS scale in the first and fourth weeks showed no difference. This finding suggests that Ramadan fasting does not worsen overall mental conditions (Elsahoryi et al., 2025). The results of this study are also almost in line with research (Chtourou et al., 2011) showed a decrease in several POMS components such as DEP, FAT, CON and VIG, and an increase in TEN and ANG. However, the results of the difference test for week one and week four did not show a significant difference. These results are supported by research (Alsowaid et al., 2021) which also concluded that there was no difference in the level of Depression during physical activity in the month of Ramadan. So with this result, it can be stated that Ramadan fasting has no impact on the level of respondents' mood state (Jandali et al., 2024).

Interestingly, correlation analysis in the fourth week revealed a significant positive relationship between the duration of low-intensity physical activity and TMD (mood disturbance) scores ($r = 0.420$, $p = 0.033$). This means that individuals who do more light activity tend to have higher mood disturbance (worse mood). This finding can be interpreted that the intensity of the activity plays a role in its psychological effects. Sports psychology studies confirm that moderate-intensity exercise is sufficient to reduce depressive symptoms, while higher intensity provides greater benefits for general psychological functioning (Jandali et al., 2024). In other words, light physical activity may not produce biological effects such as endorphin release or neurochemical regulation that are needed for optimal mood improvement. This is in line with WHO's statement that regular physical movement will release brain chemicals (e.g. endorphins and serotonin) that improve mood and relieve anxiety and depression (World Health Organization, 2022). Therefore, participants who only do light exercise while fasting may not gain as much psychological benefit as those who do moderate activity. This correlation suggests that to support emotional well-being, it is recommended that physical activity during fasting should include at least moderate intensity – such as brisk walking or light gymnastics – rather than only very light activity.

The results of this study strengthen the role of physical activity as a supporter of mental health even though it is carried out during the fasting month. Concerns that physical exercise during the fasting month will have negative effects on the community can be avoided by planning regular physical exercise to regulate the level of physical activity carried out. With improved mental health, it will increasingly provide a refreshing and relaxed feeling which will later be related to improved mental health. Routine activities that can be carried out during the month of Ramadan such as walking, dancing, gardening, cycling or doing housework happily will increase the release of endorphin hormones, which will later be able to increase self-confidence.

The results of this study will be an additional application that can be done by Muslims during the month of Ramadan or even intermittent fasting practitioners. This study recommends that at that moment an individual must continue to do physical activity to improve mental health (World Health Organization, 2022). Recommendations for physical activity during the month of Ramadan can be started with light exercise after breaking the fast, ensuring fluid balance when breaking the fast and sahur is also something that needs to be considered. Furthermore, the community must pay attention to adequate rest patterns to ensure that the body recovers and becomes the availability of energy in the body. Similar strategies have been applied in the context of competitive sports: Muslim athletes adjust their training schedules (for example, reducing intensity or duration), increasing recovery time, and preparing mentally (patience and strengthening motivation) to stay fit and focused during fasting (Kirkendall et al., 2012). Thus, the combination of planned physical exercise and emotional readiness helps to maintain a good mood. In short, even light physical movement done regularly as recommended (World Health Organization, 2022) can support the release of positive hormones and emotional stabilization during fasting.

Limitations and Suggestions The research in this study used self-report data (IPAQ and POMS) with a limited sample, so it is susceptible to memory bias and respondent subjectivity. For further research, it is recommended to use objective physical activity measuring devices such as accelerometers or pedometers for higher accuracy. In addition, further studies can explore variations in fasting types (for example comparing Ramadan with intermittent fasting patterns 16:8 or fasting on-off) and other moderating factors (age, gender, religious activities). Longitudinal methods involving larger samples are also needed to test the stability of findings and the long-term causal relationship between physical activity intensity and psychological well-being. With a more comprehensive approach, future research can strengthen the generalizability of the results and provide optimal exercise recommendations during the fasting period.

CONCLUSION

Overall, Ramadan fasting did not significantly change physical activity levels or stress mood in the short term. However, high levels of light activity were associated with greater mood disturbances at the end of the fasting month. These findings underscore the importance of maintaining physical activity at a minimum moderate intensity for optimal psychological benefits. Even light physical activity can help maintain mental health during fasting, as long as it is done routinely and planned according to individual needs.

REFERENCES

Allen, M. S., & Vella, S. A. (2015). Longitudinal determinants of walking, moderate, and vigorous physical activity in Australian adults. *Preventive Medicine*, *78*, 101–104. https://doi.org/10.1016/j.ypmed.2015.07.014

Alsowaid, L., Perna, S., Peroni, G., Gasparri, C., Alalwan, T. A., & Rondanelli, M. (2021). Multidimensional evaluation of the effects of Ramadan intermittent fasting on the health of female students at the University of Bahrain. *Arab Journal of Basic and Applied Sciences*, *28*(1), 360–369. https://doi.org/10.1080/25765299.2021.1975403

Bendau, A., Petzold, M. B., Kaminski, J., Plag, J., & Ströhle, A. (2024). Exercise as Treatment for "Stress-Related" Mental Disorders. *Current Neuropharmacology*, *22*(3), 420–436. https://doi.org/10.2174/1570159X22666230927103308

Chaves, T. S., Scarpelli, M. C., Bergamasco, J. G. A., Silva, D. G. da, Medalha Junior, R. A., Dias, N. F., Bittencourt, D., Carello Filho, P. C., Angleri, V., Nóbrega, S. R., Roberts, M. D., Ugrinowitsch, C., & Libardi, C. A. (2024). Effects of Resistance Training Overload Progression Protocols on Strength and Muscle Mass. *International Journal of Sports Medicine*, *45*(07), 504–510. https://doi.org/10.1055/a-2256-5857

Chtourou, H., Hammouda, O., Souissi, H., Chamari, K., Chaouachi, A., & Souissi, N. (2011). The effect of Ramadan fasting on physical performances, mood state and perceived exertion in young footballers. *Asian Journal of Sports Medicine*, *2*(3 SPEC. ISSUE),

177–185. https://doi.org/10.5812/asjsm.34757

Duncan, F., & Craig Liebenson, D. C. (2018). Strength matters. *Journal of Bodywork and Movement Therapies*, *22*(3), 761–765. https://doi.org/10.1016/j.jbmt.2018.06.001

Elsahoryi, N. A., Ibrahim, M. O., Alhaj, O. A., Abu Doleh, G., & Aljahdali, A. A. (2025). Impact of Ramadan Fasting on Mental Health, Body Composition, Physical Activity, and Sleep Outcomes Among University Students. *Healthcare (Switzerland)*, *13*(6), 1–18. https://doi.org/10.3390/healthcare13060639

Jandali, D., Alwaleedi, A., Marenus, M. W., Liener, S. R., Sheik, A., Elayyan, M., & Chen, W. (2024). Mental Health, Sleep Quality, and Psychological Well-Being during the Holy Month of Ramadan. *Healthcare (Switzerland)*, *12*(13), 1–14. https://doi.org/10.3390/healthcare12131301

Kirkendall, D. T., Chaouachi, A., Aziz, A. R., & Chamari, K. (2012). Strategies for maintaining fitness and performance during Ramadan. *Journal of Sports Sciences*, *30*(SUPPL.1). https://doi.org/10.1080/02640414.2012.687114

Knapik, J. J. (2015). The Importance of Physical Fitness for Injury Prevention: Part 1. *Journal of Special Operations Medicine*, *15*(1), 123. https://doi.org/10.55460/AS9H-FO5O

Marin, F., Lepetit, K., Fradet, L., Hansen, C., & Ben Mansour, K. (2020). Using accelerations of single inertial measurement units to determine the intensity level of light-moderate-vigorous physical activities: Technical and mathematical considerations. *Journal of Biomechanics*, *107*, 109834. https://doi.org/10.1016/j.jbiomech.2020.109834

Mehta, S. P., Jarvis, A., Standifer, D., & Warnimont, C. (2018). International Physical Activity Questionnaire. *Critical Reviews in Physical and Rehabilitation Medicine*, *30*(2), 125–127. https://doi.org/10.1615/CritRevPhysRehabilMed.2018026180

Roberts-Lewis, S. F., White, C. M., Ashworth, M., & Rose, M. R. (2022). The validity of the International Physical Activity Questionnaire (IPAQ) for adults with progressive muscle diseases. *Disability and Rehabilitation*, *44*(23), 7312–7320. https://doi.org/10.1080/09638288.2021.1983042

Schmidt, S. C. E., Tittlbach, S., Bös, K., & Woll, A. (2017). Different Types of Physical Activity and Fitness and Health in Adults: An 18-Year Longitudinal Study. *BioMed Research International*, *2017*, 1–10. https://doi.org/10.1155/2017/1785217

Stults-Kolehmainen, M. A., & Sinha, R. (2014). The effects of stress on physical activity and exercise. *Sports Medicine (Auckland, N.Z.)*, *44*(1), 81–121. https://doi.org/10.1007/s40279-013-0090-5

Warburton, D. E. R., Nicol, C. W., & Bredin, S. S. D. (2006). Health benefits of physical activity: the evidence. *CMAJ : Canadian Medical Association Journal = Journal de l'Association Medicale Canadienne*, *174*(6), 801–809. https://doi.org/10.1503/cmaj.051351

WHO. (2016). WHO Guidelines on physical activity and sedentary behaviour. In *Routledge*

Handbook of Youth Sport. https://www.who.int/publications/i/item/9789240015128

World Health Organization. (2022). *Physical activity - great for your body, great for your mind.*

Yoon, E. S., Park, S. J., & Park, S. H. (2019). Associations between Psychological Stress and Exercise in Korean Adults: Finding from the Korean Genome and Epidemiology Study. *Exercise Science*, *28*(4), 355–364. https://doi.org/10.15857/ksep.2019.28.4.355