

ORIGINAL ARTICLE 

The association between physical activity and emotional intelligence: A cross sectional study from Quest International University, Perak

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ABSTRACT**Introduction:**

Physical activity (PA) is an indifferent part of physical, mental and social wellness. Emotional intelligence (EI) is closely associated with appraising, perceiving, expressing, and understanding emotions, emotional knowledge that promotes emotional and intellectual growth. This study aimed to determine the relationship between PA and EI among undergraduate students.

Methods:

A cross-sectional study was conducted among 149 students using the Global Physical Activity Questionnaire (GPAQ) for PA levels, Trait Meta-Mood Scale (TMMS-30) for EI measurement and a sociodemographic questionnaire for the potential moderating influence of gender, linked to the relationships between EI and PA.

Results:

Participants showed an average EI of 101.97 ± 13.26 . Mood repair was significantly associated with PA with a spearman's rho of 0.172 (Weak positive association), and overall EI is also significantly associated with PA (Weak positive association). Women scored significantly higher in the attention to feelings (ATF) component of EI as compared to men.

Conclusion:

Students who performed PA had higher levels of overall EI as well as mood repair. The relationship found is relatively small, and PA's predictive power regarding mood repair (MR) and overall EI were feeble. Men performed higher PA levels whereas women more frequently performed PA although at lower levels compared to men.

Keywords

Emotional intelligence, gender, mood, physical activity, undergraduate students

Introduction

Physical activity (PA) is an integrated part of physical, mental and social wellness. [1-4] PA is the movement of the body by the skeletal, which requires energy expenditure. [5] PA improves psychological wellness and helps overcome stress, anxiety, depression. Ample research in different age groups involving teenagers, college students, and old age groups documented the correlation well. [6-8]

According to the WHO, it is recommended that weekly at least 150 min of moderate-intensity physical activity; or 75 min of vigorous-intensity physical activity; or an equivalent combination of moderate- and vigorous-intensity activity of at least 600 MET-minutes per week needs for the adult age group of 18-64 years. [9] Interestingly, regular PA is a tough challenge for undergraduate students because of academic activities. A meta-analysis on undergraduates reveals PA is half of the actual requirement for the age groups. [10] Immediate benefits of PA are improved cognition, reduced acute anxiety, improved sleep, weight management, etc. [1-4, 6-8]

Emotional intelligence (EI) is the ability to perceive precisely, judge, and express emotional feelings, when they are associated with the process of thought, understand emotion and emotional knowledge, and control emotions to help emotional and intellectual growth. [11] EI is therefore concerned with knowing oneself and others, relating to others, and adjusting to and dealing with environmental requirements more effectively. So, EI is a relevant addition to guide the achievement of career success in many areas of life. [12] Earlier research evidence suggests that an increase in EI score directly proportional to wellbeing and happiness, enhanced performance and calmness and mood of an individual. [13-17] EI is a vital factor affecting individual achievement levels, mainly for collegiate. Association of mental health and stress with EI also surfaced by meta-analysis. [18, 19] Higher EI exhibited an inverse relationship with low mental and physical health and good habits such as avoiding smoking and drinking. [20-22] Sociodemographic factors such as gender may influence EI. Females have significantly higher levels of EI compared to males. [23, 24] Evidence suggests that EI levels increase gradually with the advancement of age. [25]

Growing evidence indicates that EI plays a vital role in PA. [26] A critical understanding of the conceptualization of this construct in this setting is crucial to incorporate evidence-based strategies to boost performance and mental wellbeing. Many revamped research reports showed a positive relationship between PA and EI; however, studies are deficient from Malaysia. A previous study by Omar et al. amongst the University staff showed a positive co-relation between PA and EI. [27] Another study from Universiti Putra Malaysia on Malaysian students reported physical activity could boost mental health. [28] Hence, this research aims to study the relationship between PA and EI among undergraduate students at Quest International University (QIU).

Methods

Study period, study design and participants

This questionnaire-based study was carried out in QIU, Ipoh, Perak from December 1, 2020 to December 31, 2020. A total number of 149 students participated in the study. Four investigators of the study informed the participants about the purpose and procedure of the research. Three questionnaires were distributed online: Global Physical Activity Questionnaire (GPAQ) for PA levels, Trait Meta-Mood Scale (TMMS-30) for EI measurement, and a sociodemographic questionnaire for the potential moderating influence of gender relationships between EI and PA. Investigators clarified any doubts of the participants.

Inclusion and exclusion criteria

Undergraduate students in QIU were included in this research. Participants who are willing to take part in the study, able to read and understand the English language and given informed consent were considered. All others were excluded to avoid study bias.

Sample Size Calculation

The cross-sectional study design was used to perform this study. A convenience sampling method was applied to get the respondents.

Study tool and assessment

Emotional intelligence

We used TMMS-30 for the EI measurement, a self-report questionnaire of 30-items scored on a Likert-type scale of 5 points [29], validated by Palmer et al. [30] The TMMS was designed to offer an index of individual variation in the 'meta-mood experience' phase of mood regulation, which includes monitoring, assessing and managing feelings and emotions. It has three components: attention to feelings (ATF), clarity in discrimination of feelings (CDF), and mood repair (MR). Obtained scores from TMMS-30 are used to evaluate stable, individual variations in the way people react to their states of feeling.

Physical Activity

We used Global Physical Activity Questionnaire (GPAQ) for the PA measurement. [31] GPAQ gathers data on involvement in PA in three areas and sedentary behaviour using 16 questions. The areas include 'activity at work', 'travel to and from places', 'recreational activities' and 'sedentary behaviour'. The data obtained via GPAQ is analysed using METs (metabolic equivalents) for the calculation of PA. The intensity of the activity was recorded as 4 METs for moderate activities and 8 METs for vigorous activity.

Data management and statistical analysis

The data obtained via the questionnaires distributed were analysed using Statistical Package for the Social Sciences (SPSS) windows version 22. A descriptive analysis was

performed to examine the characteristics of the sample, and the level of PA is calculated via GPAQ. The characteristic of the sample was described by mean, frequency, percentage and standard deviation (descriptive statistics). The analysis was stratified by gender. To evaluate whether or not EI was influenced by gender, an independent T-test was carried out, and a Mann-Whitney U-Test was performed to find if PA levels were related to gender. η^2p was used to estimate the effect size, defining values under 0.06 as a small effect, values between 0.06 and 0.14 as a moderate effect, and values above 0.14 as a significant effect. Spearman's correlation (Non-parametric inferential statistics) analysis was used to evaluate the relationship between EI components and PA. $p < 0.05$ was considered statistically significant.

Ethical committee approval

We obtained permission from the research and ethics committee before data collection and maintained the anonymity of respondents. Name, address, and phone number were not collected for the purpose of the research. We used informed consent for the participants.

Results

Table 1: Socio-demographic factors of respondents (n=149)

Categorical Variables	n	(%)
Gender	Male	53 (35.70)
	Female	96 (65.30)
Subject Area	Medicine	101 (67.80)
	Non-Medicine	48 (32.20)
Ethnicity	Afro-Arab	1 (0.70)
	Arab	1 (0.70)
	Australian	1 (0.70)
	Brunei	1 (0.70)
	Cambodian	1 (0.70)
	Pakistani	1 (0.70)
	Syrian	1 (0.70)
	Bangladesh	2 (1.30)
	Eurasian	2 (1.30)
	African	3 (2.00)
	Maldivian	4 (2.70)
	Punjabi	4 (2.70)
	Sri Lankan	4 (2.70)
	Malay	9 (6.00)
Chinese	36 (24.20)	
Indian	78 (52.30)	

Table 1 represents the demographic data. 35.70% of the participants were men, whereas 65.30% were women. 67.80% of the participants were studied medicine, whereas 32.20% of the participants belonged to non-medicine fields of study. The majority were Indians, 52.30%, followed by the Chinese 24.20% and Malay 6%.

Table 2 shows the mean age of the participants was 20.89 ± 1.94 years: Participants showed an average EI of 101.97 ± 13.26 , among which an average 36.007 ± 6.573 scored in CDF, 44.12 ± 7.03 in ATF and 21.846 ± 3.738 in MR.

Meanwhile, in PA, the mean was 4038.4 ± 7541.5 METs, with 74.5% of the participants being physically active.

Table 2: Descriptive statistics of continuous variable

Continuous variable	Mean \pm SD
Age	20.89 ± 1.94
Attention to feelings (ATF)	44.12 ± 7.03
Clarity in discrimination of feelings (CDF)	36.01 ± 6.57
Mood repair (MR)	21.85 ± 3.74
Overall EI	101.97 ± 13.26
Physical Activity (PA)	4038.39 ± 7541.36

74.5% (Physically Active)

Table 3: Spearman's correlation of domains of EI with PA

Variable	PA level Spearman's rho	P value
Attention to feelings (ATF)	0.077	0.351*
Clarity in discrimination of feelings (CDF)	0.149	0.07*
Mood repair (MR)	0.172	0.036*
Overall EI	0.171	0.037*

* $p < 0.05$

Table 3 depicts Spearman's correlation of domains of EI with PA. Mood repair (a component of EI) was significantly associated with PA with a spearman's rho of 0.172 (Weak positive association), and overall EI was significantly associated with PA (Weak positive association).

Table 4: EI univariate analysis according to gender

	Men	Women	P value	η^2p
Attention to feelings (ATF)	42.2 ± 6.82	45.2 ± 6.94	0.011*	.185
Clarity in discrimination of feelings (CDF)	36.0 ± 6.25	36.0 ± 6.78	0.993*	.230
Mood repair (MR)	22.2 ± 3.70	21.7 ± 3.77	0.461*	.109
Overall EI	100.3 ± 12.40	102.9 ± 13.68	0.254*	.324

* $p > 0.05$, * $p < 0.05$

Table 4 shows a descriptive summary of the EI dimension according to gender. Women scored significantly higher in the ATF component of EI as compared to men. In contrast, the other components had a negligible and insignificant difference between both genders.

Table 5: PA (METs) univariate analysis according to gender

	Men	Frequency (%)	Women	Frequency (%)	P value	η^2p
PA	5551.3 ± 10675.4	73.6	3203.1 ± 4923.2	75.0	0.563*	.475

* $p > 0.05$

Table 5 shows a descriptive summary of PA calculated in METs according to gender. Although no significant differences between both genders were found, men seem to have a higher level of PA (5551.3 ± 10675.4 METs) compared to women. In contrast, women seemed to be more physically active (75%) as compared to men.

Discussion

Numerous studies have indicated ambiguity in the EI score between genders. [23, 24, 32] Similarly, the current research found that women had a higher overall EI than men (albeit insignificantly). The present findings may be explained by the fact that EI emphasises emotional regulation, communication, and interpersonal skills. [33] Women are more expressive of their emotions than men, better understand emotions, and be more adept at specific interpersonal skills. Women, for example, are more adept at recognising other people's emotions, more perceptive, and generally more empathetic. [34] As a result, their EI ought to be higher as compared to men. Furthermore, some evidence suggests that some regions of the brain devoted to processing emotions in women are larger than men and that there is a gender difference in cerebral function. [35]

This study shows a significant difference in one EI dimension (ATF) between genders, with women scoring higher on ATF, consistent with previous findings. Findings revealed that men (although not statistically significant in the current study) had higher MR scores. In contrast to previous studies, which found that men scored higher on the CDF, we observed men and women scored equally on the CDF, which may be due to the study's unequal male-female ratio.

We observed the mean PA level of the undergraduate students in QIU was 4038.39 ± 7541.36 METs. The recommended level of PA according to the GPAQ is 600 MET minutes for an adult (subject to change according to body weight and age). Hence, the present study showed that, on average, QIU undergraduate students had optimal PA levels. Although insignificant, men seem to have a higher average of PA levels (5551.3 ± 10675.4) than women, similar to a study done by Pengpid et al., 2015 on undergraduate students from 23 different countries where the PA levels of the women were lower than that of the men. [36] Abel et al. in 2001 coined the word "gender bias" in their research to illustrate the function of the domains assessed on differences in PA levels between the genders. He observed men were more likely to participate in exercise and sports, whereas women were more likely to walk and bike every day. [37] This could explain the higher average PA levels in MET minutes in men as compared to women. In comparison to Pengpid et al., which found that only 59.9 per cent of participants were physically active, the current study discovered that 74.5 per cent of undergraduates at QIU were physically active, with women being more physically active than men. Craft et al. proposed a possible explanation for this by stating that while men engaged in

more intense exercise, women were involved in moderate to light exercise but at a higher frequency than men. [38] This proposed idea is directly in line with the present research as men were less frequently active than women but had higher PA levels. Additionally, another possible explanation for the predominance of PA in women could be the study's unequal gender ratio, with women being significantly more numerous than men. Even though the numbers are still small, the relationship between PA and EI has been researched worldwide. [39, 40, 41] The present study's findings, while preliminary, support a positive relationship between PA and EI, as previous research in undergraduate students has demonstrated, with weak but significant positive associations between overall EI and PA.

By examining how exercise affects social and mood control, Saklofske et al. established a link between exercise and EI. [42] Additionally, Li et al. also demonstrated that students with higher PA levels had a more optimistic outlook, a more confident outlook, and a lower negative mood. [39] Likewise, according to Bostani et al., EI can be increased as long as the individual engages in PA. [43] According to Omar Dev RD et al., people with a high degree of PA have improved EI on emotion appraisal and regulation. [44] The current study discovered a significant, albeit weak, positive relationship between MR and PA. Perhaps this is because exercise releases hormones such as endorphins, which act as natural mood elevators. The study findings suggest that individuals who perform PA at recommended levels have a more favourable EI in general, particularly a more favourable mood repairability. EI is crucial because it protects individuals against stressful situations, unhealthy lifestyles, drinking habits and substance abuse. [45] PA promotion strategies can enhance individuals' psychological adaptability, with a beneficial effect on health. The relationship between PA and emotional variables is an area that requires further research, and this study made a significant contribution to the literature in that area.

Conclusion

There was a positive relationship between overall EI and PA. Undergraduate students who engage in PA demonstrated increased levels of both overall EI and mood repair. The relationship discovered is relatively small, and PA's predictive power for MR and overall EI is relatively low. Men engaged in higher levels of PA, whereas women were involved in it more frequently but at a lower level than men. Women also scored higher on the ATF than men.

Limitation and future scope

Our research has some unavoidable limitations. These disadvantages stem from the study's cross-sectional nature, deriving causal relationships from the variables studied nearly impossible. Since this study involved only QIU undergraduates, generalising our findings would be

difficult. As a result, longitudinal studies examining the effects of PA on EI are necessary.

Abbreviations

Attention to feelings (ATF), clarity in discrimination of feelings (CDF), Emotional intelligence (EA), Global Physical Activity Questionnaire (GPAQ), METs (Metabolic Equivalents), mood repair (MR), Physical activity (PA), Quest International University (QIU), Statistical Package for the Social Sciences (SPSS), Trait Meta-Mood Scale (TMMS-30)

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Authors' contribution

- a. Study planning: BR, SKC
- b. Data collection: SM, SR, CWQ, GPDBP, KDSSJ
- c. Data analysis/ interpretation: SKC, SM, SR, CWQ, GPDBP, KDSSJ
- d. Manuscript writing: BR, SKC
- e. Manuscript revision: BR, SKC, SM, SR, CWQ, GPDBP, KDSSJ
- f. Final approval: BR, SKC, SM, SR, CWQ, GPDBP, KDSSJ
- g. Agreement to be accountable for all aspects of the work: BR, SKC, SM, SR, CWQ, GPDBP, KDSSJ

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Availability of data and materials

All data underlying the results is available as part of the article, and no additional source data is required.

Competing interests

None declared.

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