INFLUENCE OF EMOTIONAL INTELLIGENCE AS THE MEDIATOR BETWEEN PHYSICAL ACTIVITY AND MENTAL HEALTH (DISTRESS) AMONG MALAYSIAN UNIVERSITY STUDENTS

Roxana Dev Omar Dev[1] and Amir Rifaat Abdul Rahman[2]
[1]Mrs, Universiti Putra Malaysia, MALAYSIA, roxana.dev@gmail.com
[2]Mr, Universiti Putra Malaysia, MALAYSIA, amir.rifaat@gmail.com

Abstract

University students typically enter a dynamic transitional period of new independence from their parents that are characterized by many factors. These factors such as social, financial, and environment can be a burden and puts them at risk of mental health distress. Engaging in physical activity has proved to give benefits to mental health. However, not many university students are active during their years at the university. Few psychosocial factors such as emotional intelligence were seen to increased students physical activity and decrease mental distress. Therefore, the purpose of the study is to see whether emotional intelligence can mediate the relationship between physical activity and mental health (distress) among university students at Universiti Putra Malaysia, Malaysia. A correlation study with path analysis was conducted on 266 students at Universiti Putra Malaysia. Few instruments were used such as International Physical Activity Questionnaire SF (IPAQ-SF), General Health Questionnaire-28 (GHQ-28), and Schutte Self Report Emotional Intelligence Test (SSEIT) was used in this study. Path analysis was used to explore association between these aspects. Physical activity, mental health distress and emotional intelligence were significantly correlated and emotional intelligence showed partial mediation effect towards the relationship between physical activity and mental health distress ($p<0.00$). Thus, there was an association between physical activity with mental health distress, and emotional intelligence partially mediated this relationship. We interpret these novel data to suggest that physical activity can boost mental health and these physical activity-associated of emotional intelligence relevantly gives benefits in mental health. Such data have important implications for both health practice and policy especially in higher education institutions.

Keywords: Emotional intelligence, physical activity, mental health, undergraduate students.

1. INTRODUCTION

The university years can be demanding on many university students as they faced a great deal of pressures and challenges that pose a variety of physical, social and emotional threats (Rodgers & Tennison, 2009). As a result, they become more vulnerable for developing mental health distress and problems (Saleem & Mahmood, 2013; Eisenber et al., 2007). The common problems faced by university students are mood disturbances, destructive behaviors, depression, anxiety and eating disorders (Cooley et al., 2007). Even

though, mental health (MH) distress has become one of the issues in public health interest, however, this issue has not been taken seriously enough as a major health burden (Sowers, Rowe, & Clay, 2009). In Malaysia, 16.8% of global burden of disease is contributed to neuropsychiatric disorders (World Health Organization, 2011). With this alarming continuous condition the Ministry of Health Malaysia has taken precautions and interventions to reduce this public health burden (Ministry of Health Malaysia, 2014). Therefore, many measures have been taken to reduce this increasing health burden. Such measure is worth looking at is physical activity.

Physical activity (PA) is known to have a variety of positive effects on the functioning of human beings and also has been recognized as the main factor that can maintain and improve human health (Roxana Dev, et al., 2014). There is a large amount of evidence that shows positive impact of PA towards protecting the body from getting such chronic diseases such as diabetes mellitus, osteoporosis, stroke, hypertension, colon cancer, obesity, depression and heart disease (World Health Organization, 2010). In fact, chronic diseases were mostly found to develop in individuals who have little or no PA compared to those who participates regularly (Chu & Moy, 2015).

On top of that, PA also shown to be useful in decreasing morbidity in psychiatric populations, prevent psychological problems, and improve the MH condition especially on normal population (Richardson et al., 2014). In addition, PA also benefits the emotional health as well (Roxana Dev, et al., 2012). In short, participating in PA is one of the best ways to increase physical, psychological as well as emotional health (Li et al., 2009).

Even though there are a lot of benefits through PA participation, in the context of participation among university students, more than half report a decrease in their PA participation after high school (Buchworth & Nigg, 2004). This is also seen even though there have access to equipment, sports facilities and also knowledge about the importance of PA (Buckworth & Nigg, 2004). This trend is truly seen in Malaysian university students as they struggle hard in earning academic excellence which then unable to cope with stress and consequently prone to experience mental, emotional, physical and psychological problems (Shamsuddin et al., 2013).

However, this trend can change through adaptation on the influence of emotions. According to Li, Lu, & Wang (2009), good emotion handling is a motivating factor for most human behavior. In other words, the ability to verify various forms of emotion in conjunction with thinking process, and use of this ability to manage personal growth is defined as emotional intelligence (EI) (Mayer, Salovey, Caruso, & Sitarenios, 2001). Li et al. (2009) showed that EI was one of the psychological mechanisms that were responsible for positive changing behavior that associated with physical activity participation which was also seen in a Malaysian study (Roxana Dev et al., 2012). Meanwhile, a study by Pourmohamadreza-Tajrishi, Ashori, & Jalilabkenar (2013), demonstrated that EI program had positive effect on promoting mental health such as stress management and mood. Therefore, with the combination of these various past studies, this study aims to investigate the influence of EI as the mediator between PA and MH (distress) on public university students in Malaysia.

2. LITERATURE REVIEW

2.1. Emotional Intelligence Theory

Salovey and Mayer (1990) who first use the term “emotional intelligence” defined EI as a set of skills that have been hypothesized on the contribution to the accurate appraisal and expression of emotion in oneself and others. This theory is based on the social intelligence and personal intelligence and this model had been viewed as a subset of social intelligence (combination of intrapersonal and interpersonal intelligence underlining the non-cognitive aspect of intelligence (Hari, 2011). Salovey and Mayer (1990) conceptualized the EI into three domains which are: first, appraisal and expression of emotion on oneself and others; second, regulation of emotion on oneself and others; and the third domain is utilizing of emotion through flexible planning, creative thinking, redirected attention and motivation.

Schutte et al. (1998) makes a new measure of EI that was based on a theoretically cohesive and comprehensive model by Salovey and Mayer (1990) and revised the model in 1997 to a more cohesive and comprehensive models of EI. There are 33 items represented by Schutte et al. (1998) and it is proportioned to Salovey and Mayer (1990) model where 13 items came from among those generated for appraisal and expression emotion model, 10 items came from among those items generated for regulation of emotion model, and another 10 items came from among those items generated for the utilization of emotion model. Therefore, the new four-branch model of skills involved in EI are perceiving emotion, assimilating emotions, understanding emotions and managing emotions (Mayer, Caruso, & Salovey, 1999).

2.2. Emotional Intelligence effect on Physical Activity and Mental Health

Few researchers have discussed about the importance of emotional states on physical health (Saleem & Mahmood, 2013). It was claimed that the negative emotional states were related with unhealthy patterns of physiological functioning, while positive emotional states were related with healthier patterns of responding in cardiovascular activity and immune system (Tsaousis & Nikolaou, 2005). Individuals who can regulate the emotional states are healthier as they can accurately identify and appraise the emotional states, have the abilities to know suitable time and reason to express their feelings, and can affectively regulate their mood states (Saleem & Mahmood, 2007; Salovey & Mayer, 1990).

According to Taylor (2001)**,** individual with high level of EI can cope better with challenges in life and have the ability to control the emotion which both beneficial for psychological and physical health. Moreover, it was also claimed that EI individuals, who are capable at expressing, understanding, and managing emotions, and who are able to cope with stress will be healthier than those who are with lower in EI (Keefer, Parker, & Saklofske, 2009). In fact, a study from Li et al. (2009) which explored the relationship of physical activity, EI and health among Taiwan college students, showed that individuals with higher level of PA had higher intrapersonal and interpersonal skills, better stress management skills, lower negative mood, increased positive mood, optimistic and higher self-esteem. Moreover, it was shown that higher PA participation within a week will tend to have better EI level (Roxana Dev et al., 2014). A study by Bostani and Saiiari (2011) also showed that PA increase EI, regardless amount of time that was spent.

Moreover, EI has been found to be positively correlated with some measures of psychological well-being which were life satisfaction and happiness, but negatively correlated with depression, stress and loneliness (Saklofske et al., 2007). It was believed that EI is a complex construct that contained emotion, personal and social abilities as included in self-assessment of emotion on one self and other, create and maintain relationship with others, ability to express emotion, emotion management, self-control, and affective problem solving (Pourmohamadreza-Tajrishi et al., 2013).

2.3. Emotional Intelligence as the Mediator variable

The mediating effect of EI on the relationship between PA and mental health has not been done before. Saklofske et al. (2007) showed that potential of EI as the mediator between personality and exercise behavior similar as the role of coping. To date, EI provide a mechanism regarded as having coping attributes toward the personality and health behavior (Saklofske et al., 2007).

Hassan and Shabani (2013) examined the mediating role of EI between spiritual intelligence and MH problems. It was found that EI significantly lowered MH problems and had indirect mediation effect between the relationship of spiritual intelligence and MH problems. Another study examined trait EI as the mediator between personality and health (Johnson, Batey, & Holdsworth, 2009). With such skills of EI, these individuals may manage their negative emotions successfully and thus decrease their stress level and lowered negative impact on health (Johnson et al., 2009).

Last but not least, Schutte and Malouff (2011) examined whether EI mediates the relationship between mindfulness and subjective well-being. It was reported that high level of mindfulness showed high level of EI and such level of EI promotes higher levels of positive effect, lower levels of negative affect and greater life satisfaction (Schutte & Malouff, 2011).

3. RESEARCH METHODOLOGY

Participants were recruited from Faculty of Educational Studies in one of Malaysian public universities. 266 students participated by using proportionate stratified random sampling technique. There were three main instruments used in the study. The International Physical Activity Questionnaire – Short Form (IPAQ-SF) retrieved from www.ipaq.ki.se was used to analyze the participation of the students in PA. The IPAQ-SF asked about the time that the students spent on physical (PA) for the last seven days. There are three specific types of activity which are vigorous-intensity activities, moderate-intensity activities, walking and sitting by measuring the frequency (days per week) and duration (time per day) with 7 items.

These categories may be treated separately to obtain specific activity patterns or multiplied by their estimated value in Metabolic Equivalent of Tasks (METs) and been summed for overall estimation of PA in a week. The reliability analysis of IPAQ-SF gained through this study was .56. The reliability analysis score for this study was in acceptable range as been reported by Booth et al. (2003) where findings on multi-country reliability score are ranged from .34 to .89.

Next, General Health Questionnaire (GHQ-28) (Goldberg, 1978) was used to identify persons whose mental

condition has undergone a temporary or long-term breakdown due to experienced difficulties, problems or mental illness and also persons at risk of mental health (MH) disorders. GHQ-28 asked the participants to assessed changes in his or her mood, feelings and behaviors in the period of past four weeks. There are 28-items with four constructs which are: 1) somatic symptoms; 2) anxiety or insomnia; 3) social dysfunction; and 4) severe depression which been evaluated with 4-point Likert scale. This study gain Cronbach alpha of 0.87 which fall in acceptable range that was reported by Jackson (2007) 0.78 to 0.95 in many studies.

Lastly, Schutte Self-Report Emotional Intelligence Test (SSEIT) (Schutte et al., 1988) was used to measure three facets of emotional quotient (Salovey & Mayer, 1990) which are 1) the appraisal of emotion in self and others; and the expression of emotion, 2) the regulation of emotion in self and others, and 3) the utilization of emotion in problem solving. SSEIT comprised of 33-items using a 5-point Likert scale that based on four dimensions of emotional intelligence (EI) which are perceive emotions, utilizing emotions, regulating emotions and managing emotions. The Cronbach alpha reported by Schutte et al. (1998), was .87 while this study attain .95.

The data was collected within three weeks and the questionnaires were completed anonymously with some additional information regarding gender, age, races, department, and current year of study. IBM Statistical Package for Social Science Statistics (version 20.0) and IBM Statistical Package for Social Science Amos (version 22.0) were used for data analysis. Besides, correlation analysis between PA, MH and EI, the mediating effect of EI towards the relationship between PA and MH was also analyzed using path analysis in AMOS.

4. RESULTS

Total number of respondents were n = 266 where 33.4% (n = 89) was male and 66.5% (n = 177) was female. Based on department demographic analysis, which is given in Table 4.1; 8.6% (n = 23) were from Counselor Education and Counseling Psychology, 25.6% (n = 68) were from Sports Studies, 38.7% (n = 103) were from Science and Technical Education, and lastly 27.1% (n = 72) were from Language and Humanities Education.

Table 4.1 Demographic profile

Demographic variable		N	Percent
Gender	Male	89	33.4
	Female	177	66.5
Department	Counselor Education & Psychology	23	8.6
	Sports Studies	68	25.6
	Science and Technical Education	103	38.7
	Language & Humanities Education	72	27.1

In this study, 42.9% (n = 114; as depicted in Table 4.2) of the respondents reported high PA level, while 42.5% (n = 113) reported with moderate physical activity (PA) level and 14.7% (n = 39) were in low PA level category. Meanwhile, most of the respondents were in low probability psychiatric distress category (97.4%, n = 259) as it shows low mental health (MH) (distress). Only 7 respondents were stated as high probability psychiatric distress with 2.6% from 266 respondents. There were three categories of emotional intelligence (EI) been reported which are low EI (1.1%, n = 3), moderate EI (25.2%, n = 67) and high EI (73.7%, n = 196). Thus, most of the respondents were high in EI.

Table 4.2 Frequency, percentage and level for IPAQ-SF, GHQ-28 and SSEIT

Item		N	Percent
IPAQ-SF	Low (<600 MET-min/week)	39	14.7
	Moderate (≥600 to≤3000 MET-min/week)	117	32.5
	High (≥3000 MET-min/week)	114	42.9
GHQ-28	Low probability psychiatric distress (≤12)	7	2.6
	High probability psychiatric distress (>12 to 84)	259	97.4
SSEIT	Low EI (≤77)	3	1.1
	Moderate EI (>77 to ≤122)	67	25.2
	High EI (>122)	196	73.7

Pearson product-moment correlation coefficient was computed to assess the relationship between PA, MH (distress) and EI. Correlation analysis in Table 4.3, indicated that there was a significant negative relationship between PA and MH (distress) ($r = -.249$, $p = .000$) and significant negative relationship between

EI and MH (distress) (r = -.155, p = .011). Meanwhile, a significant positive relationship between PA and EI was determined (r = .138, p = .024).

Table 4.3 Relationship between physical activity, mental health (distress) and emotional intelligence

		Physical Activity	Mental Health (distress)	Emotional Intelligence
Physical Activity	Pearson Correlation	1		
	Sig. (2-tailed)			
Mental Health (Distress)	Pearson Correlation	-.249**	1	
	Sig. (2-tailed)	.000		
Emotional Intelligence	Pearson Correlation	.138*	-.155*	1
	Sig. (2-tailed)	.024	.011	

In order to establish mediation, the independent variable must first demonstrate a significant effect on both the dependent and mediator variable. Therefore, since analysis successfully support the prerequisite relationship between PA, MH (distress) and EI, the mediating effect of EI can be tested. Table 4.4 showed the direct effect of PA on MH (distress) without the mediator variable has been illustrated in Figure 4.1. The results showed that there was a significant relationship between PA and MH (distress) with β = -.249, p < .001. The results indicated that as PA increased by 1 standard deviation, MH (distress) decreased by .249.

Table 4.4 Model without mediator

Regression weights	Estimate	SE	C.R.	P. Value
MH ← PA	-.249	.001	-4.193	***

Figure 4.1 Direct effect of PA toward MH (distress)

Next, results in Table 4.5 showed the direct effect of PA on MH (distress) with mediator variable has been illustrated in Figure 4.2. The results stated the direct effect of PA to MH (distress) was significant with β = -.232, p < .001. It can be indicated that when PA increased by 1 standard deviation, MH (distress) decreased by .232. On the other hand, PA variable had a significant direct effect to EI with β = .138, p < .05. It can be indicated that as PA increased by 1 standard deviation, EI will increased by .138. Lastly, EI direct effect toward MH (distress) was also significant with β = -.123, p < .05. It can be indicated that when EI increased by 1 standard deviation, MH (distress) will decreased by .123.

Table 4.5 Model with mediator

Regression weights	Estimate	SE	C.R.	P. Value
MHD ← PA	-.232	.001	-3.901	***
EI ← PA	.138	.001	2.269	.023
MH ← EI	-.123	.030	-2.063	.039

As the mediator variable was placed in the model (Refer to Figure 4.2), the direct effect estimate was slightly decreased from β = -.249 to β = -.232 and the results is significant at p < 001. This finding showed that EI was partially mediated relationship between PA and MH (distress) because the direct effect is still significant after adding mediator into the path analysis.

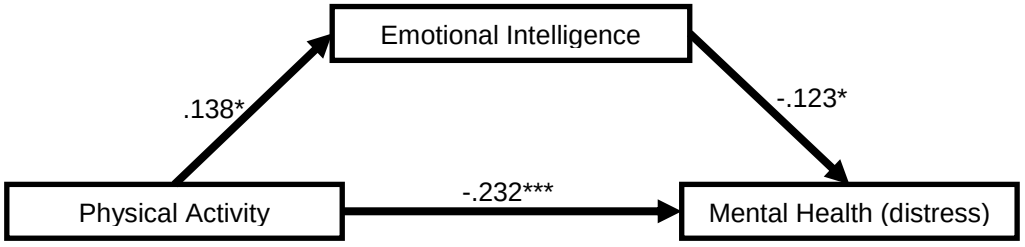

Figure 4.2 Indirect effect of PA, MH (distress) and EI

In this study, bootstrapping method was used to examine the significant of the mediation. 2000 samples were requested for bootstrapping; a bias-corrected and accelerated confidence interval (CI) was set to 95% CI. The results showed in Table. 4.6 indicated that EI had a significant mediation effect with lower bound = -.044, and upper bound = -.003, with p = .011 < .05.

Table 4.6 Bias-corrected percentile method

	Lower-bounds Physical Activity	**Upper-bounds Physical Activity**	**Two-tailed Sig**
Mental Health (distress)	-.044	-.003	.011*

Table 4.7 is a summary for direct effect and indirect effect of PA on MH (distress). The direct effect of PA to MH (distress) was β = -.232 and significant at p < .001. The indirect effect of PA to MH (distress) with EI as the mediator variable with a significant β = -.017, p < 01.

Table 4.7 Summary of EI as mediator

Hypothesis	**Direct effect (x → y)**	**Indirect effect**	**Result**
PA → EI → MHD	-.232***	-.017**	Partial Mediation

5. DISCUSSION

This study found that there was a weak negative correlation between physical activity (PA) and mental health (MH) (distress). This study was supported by Monica (2014) as it stated that participating in PA regularly affects MH, boost self-esteem and reduce the risk of stress, depression, anxiety and mental disorder. Moreover, Jewett et al. (2014) showed that students who regularly attended sports activities reported lower depressive symptoms, lower perceived stress, and higher self-rated MH. Next, McPhie and Rawana (2015) stated that PA assisted the adolescence to become more resilient to depressive symptoms. In addition, Kubaisy et al. (2015) explained that PA gave impact towards psychological, cognitive and emotion to give a feeling of relaxed, happy, decrease depression risk, and enhance confidence and self-esteem. This study showed that higher participation in PA decreased the negative aspects of psychological or MH problems.

Next, it was also found that there was a significant weak positive correlation between PA and emotional intelligence (EI). Association between PA and EI has been studied globally even though the numbers are still limited. However, this study indicated that there was an association between those variables. Some of the previous research supported the findings in this study. Saklofske et al. (2007) found that there was a relationship between exercise and EI by stating the effect of exercise towards social and mood regulation. Moreover, it was also supported by Li et al. (2009) as they found that higher level of PA will lead students to have more positive mood, optimistic attitude and lowering negative mood. Bostani and Saiiari (2011) also found that EI can be increased as long as the person participates in PA. In addition, Roxana Dev et al. (2014) stated that individuals with high level of PA will have better EI on appraisal of one's emotion and regulation of emotion.

On the other hand, this study also found that there was significant weak negative relationship between EI and MH (distress). There are a few previous researches supported the findings in this study. Saklofske et al. (2007) well supported this study's findings as EI has positively correlated with positive psychological well-being such as life satisfaction and happiness while, EI has negatively correlated with negative psychological well-being such as depression, stress and loneliness. Equally, Lougheed and Hollenstein (2012) reported that high range of emotional regulation lowered the internalizing problems such as depression, anxiety and social anxiety while lower range of emotional regulation increased internalizing problems in adolescents. Moreover, Pourmohamadreza-Tajrishi et al. (2013) also found negative correlation between EI and MH among deaf students as it was stated that enhancing EI in deaf students through training could reduce psychological problems such as somatic symptoms, anxiety, social dysfunction and depression.

This study found that there was a significant partial mediating effect of EI on the relationship between PA and MH (distress). Prior to the collection of data, researcher had reviewed in depth on the role of EI as the mediator for any relationship. Saklofske et al. (2007) found the potential of EI as the mediator between personality and exercise behavior. It was found that EI mediated the relationship between personality and exercise behavior. This showed that EI has the capability to mediate a relationship with PA as variable, thus

support the finding in this study where EI was correlated with PA.

In addition, Johnson et al. (2009) explained that individuals with high skills in EI can manage negative emotion, decrease stress (mental health) and lowered negative impact on health among university students. Based on the finding from Johnson et al. (2009), the results showed a significant mediating effect of EI between personality and health. Furthermore, Schutte and Malouff (2011) found that EI mediated the relationship of mindfulness and subjective well-being by explaining mindfulness was correlate with MH and better mindfulness will have better MH, and individual with better MH showed higher level of positive effect, lower negative affect and greater life satisfaction.

Meanwhile, Hassan and Shabani (2013) examine the mediating role of EI between spiritual intelligence and MH problems. As expected, it was found that EI decrease MH problems (negative psychological aspects) and showed full mediation role between the relationship of spiritual intelligence and MH problems (Hassan & Shabani, 2013). Previous study from Hassan and Shabani (2013) showed that the capability of EI as the mediator to MH as the variable, thus supporting the present study finding where EI was correlated with negative MH distress.

6. CONCLUSION

In conclusion, it was found that higher level of PA can decrease negative MH such as somatic symptoms, anxiety or insomnia, social dysfunction and severe depression. This means that physically active individual did not only increase their physical health but also in MH. Furthermore, this study also found that PA was positively correlated with EI. Higher level of PA elevated EI score thus, having better skills in perceiving, utilizing, regulating and managing emotions. Next, EI is a skill that has been discovered to associate with positive psychological well-being (happiness and life satisfaction) and also negative psychological well-being (loneliness, depress and stress) (Saklofske et al., 2007). Current study provided support for those findings by showing that EI is negatively correlated with MH (distress) (somatic symptoms, anxiety / insomnia, social dysfunction and severe depression). Having higher scores in EI will lower the elements of psychiatric illnesses.

The findings of this study indicated that EI partially mediates the relationship between PA and MH (distress), by demonstrating a reduction in the direct effect of PA on MH (distress), after inclusion of EI into the path analysis. This may suggest that individuals with high level of PA tend to use EI skills involving perceiving, utilizing, regulating and managing emotions that contribute to less MH (distress). However, the effect of PA on MH remained significant even after inclusion of the mediator, and according to Baron and Kenny (1986), this may indicate the operation of multiple mediating factors. Lastly, this research can be a turning point to improve university students' mental health and physical activity. With better mental and physical health, the Malaysian Ministry of Higher Education will be able to uphold the transformation agenda in the Malaysian Education Blue Print where healthy mind and body are an essence for lifelong learners. Hence, further studies and researches should be done to determine this issue.

REFERENCE LIST

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*(6), 1173.

Booth, M. L., Ainsworth, B. E., Pratt, M., Ekelund, U., Yngve, A., Sallis, J. F., & Oja, P. (2003). International physical activity questionnaire: 12-country reliability and validity. *Med Sci Sports Exerc, 195* (9131/03), 3508-1381.

Bostani, M., & Saiiari, A. (2011). Comparison emotional intelligence and mental health between athletic and non-athletic students. *Procedia-Social and Behavioral Sciences, 30*, 2259-2263.

Buckworth, J., & Nigg, C. (2004). Physical activity, exercise, and sedentary behavior in college students. *Journal of American College Health, 53*(1), 28-34.

Chu, A. H. Y., & Moy, F. M. (2015). Reliability and validity of the Malay International Physical Activity Questionnaire (IPAQ-M) among a Malay population in Malaysia. *Asia-Pacific Journal of Public Health, 27*(2), 2381-2389.

Cooley, E., Toray, T., Valdez, N., & Tee, M. (2007). Risk factors for maladaptive eating patterns in college

women. *Eating and Weight Disorders*, 12(3), 132-139.

Eisenberg, D., Gollust, S.E., Golberstein, E., & Hefner, J.L. (2007). Prevlence and correlates of depression, anxiety, and suicidality among university students. *American Journal of Orthopsychiatry*, 77, 534-542.

Hari, K. (2011). Emotional Intelligence of Malaysian Youth. *Malaysian Journal of Youth Studies, 5*, 143-164.

Hassan, S. A., & Shabani, J. (2013). The mediating role of emotional intelligence between spiritual intelligence and mental health problems among Iranian adolescents. *Psychological Studies, 58*(1), 73-79.

Jamaiyah, H. (2000). Community mental health in Malaysia: Marriage of psychiatry and public health. *Jurnal Kesihatan Masyarakat, 6*(S), 155-166.

Jewett, R., Sabiston, C. M., Brunet, J., O'Loughlin, E. K., Scarapicchia, T., & O'Loughlin, J. (2014). School sport participation during adolescence and mental health in early adulthood. *Journal of Adolescent Health, 55*(5), 640-644.

Johnson, S. J., Batey, M., & Holdsworth, L. (2009). Personality and health: The mediating role of Trait Emotional Intelligence and Work Locus of Control. *Personality and Individual Differences, 47*(5), 470-475. doi: http://dx.doi.org/10.1016/j.paid.2009.04.025

Keefer, K. V., Parker, J. D. A., & Saklofske, D. H. (2009). Emotional intelligence and physical health. In C. Stough, D. H. Saklofske & J. D. A. Parker (Eds.). *Assessing emotional intelligence: Theory, research, and applications* (pp. 191-218). New York: Springer.

Kubaisy, W. A., Mohamad, M., Ismail, Z., & Abdullah, N. N. (2015). Gender differences: Motivations for performing physical exercise among adults in Shah Alam. *Procedia - Social and Behavioral Sciences, 202*, 522-530. doi: http://dx.doi.org/10.1016/j.sbspro.2015.08.181

Li, G. S.-F., Lu, F. J. H., & Wang, A. H.-H. (2009). Exploring the relationships of physical activity, emotional intelligence and health in Taiwan college students. *Journal of Exercise Science & Fitness, 7*(1), 55-63. doi: http://dx.doi.org/10.1016/S1728-869X(09)60008-3

Lougheed, J. P., & Hollenstein, T. (2012). A limited repertoire of emotion regulation strategies is associated with internalizing problems in adolescence. *Social Development, 21*(4), 704-721.

Mayer, J. D., Salovey, P., Caruso, D. R., & Sitarenios, G. (2001). Emotional intelligence as a standard intelligence. *Emotion*, 232-242.

McPhie, M. L., & Rawana, J. S. (2015). The effect of physical activity on depression in adolescence and emerging adulthood: A growth-curve analysis. *Journal of Adolescence, 40*, 83-92.

Ministry of Malaysia in Health. (2014). More mental health issues soon. http://www.thestar.com.my/News/Nation/2014/08/17/More-mental-health-issues-soon-Ministry-More-Msians-expected-to-suffer-in-future/. Accessed 12 April 2016.

Monica, G. (2014). Study on the importance of physical education in fighting stress and a sedentary lifestyle among students at the University of Bucharest. *Procedia-Social and Behavioral Sciences, 117*, 104-109.

National Health and Morbidity Survey. (2011). National Health and Morbidity Survey 2011. http://www.moh.gov.my/index.php/file_manager/dl_item/554756755a584a6961585268626939485958 4a70637942515957356b645746754c31426c626d6431636e567a595734675330567a6157686864474 675494359676132463359577868626942776557747064433945955 84a70494556754c6c7068615735 315a476c7549454a4c5543387a636d5176546b684e553138794d44457858305a42513152665530684 6525651756347526d. Accessed 23 March 2016.

Pourmohamadreza-Tajrishi, M., Ashori, M., & Jalilabkenar, S. S. (2013). The Effectiveness of emotional intelligence training on the mental health of male deaf students. *Iranian Journal of Public Health, 42*(10), 1174-1180.

Richardson, C. R., Faulkner, G., McDevitt, J., Skrinar, G. S., Hutchinson, D. S., & Piette, J. D. (2014). Integrating physical activity into mental health services for persons with serious mental illness. *Psychiatric Services*. 56 (3), 324-331.

Roxana Dev, O. D., Ismi Arif, I., Maria Chong, A., & Soh Kim, G. (2014). Emotional intelligence as an underlying psychological mechanism on physical activity among Malaysian adolescents. *Middle-East*

Journal of Scientific Research, 19,166-171.

Roxana Dev, O. D., Ismi Arif, I., Mohd Sofian, O.-F., Maria Chong, A., & Soh Kim, G. (2012). Emotional intelligence as a potential underlying mechanism for physical activity among Malaysian adults. *American Journal of Health Sciences (AJHS), 3*(3), 211-222.

Saklofske, D. H., Austin, E. J., Rohr, B. A., & Andrews, J. J. (2007). Personality, emotional intelligence and exercise. *Journal of Health Psychology, 12*(6), 937-948.

Saleem, S. & Mahmood, Z. (2013). Mental health problems in university students: A prevalence study. *Journal of Social Sciences*, 7(2), 124-130.

Salovey, P., & Mayer, J. D. (1990). Emotional intelligence. *Imagination, Cognition and Personality, 9*(3), 185-211.

Schutte, N. S., & Malouff, J. M. (2011). Emotional intelligence mediates the relationship between mindfulness and subjective well-being. *Personality and Individual Differences, 50*(7), 1116-1119.

Schutte, N. S., Malouff, J. M., Hall, L. E., Haggerty, D. J., Cooper, J. T., Golden, C. J., & Dornheim, L. (1998). Development and validation of a measure of emotional intelligence. *Personality and Individual Differences, 25*(2), 167-177.

Shamsuddin, K., Fadzil, F., Ismail, W. S. W., Shah, S. A., Omar, K., Muhammad, N. A., ... Mahadevan, R. (2013). Correlates of depression, anxiety and stress among Malaysian university students. *Asian Journal of Psychiatry, 6*(4), 318-323.

Sowers, K. M., Rowe, W. S., & Clay, J. R. (2009). The intersection between physical health and mental health: A global perspective. *Journal of evidence-based social work, 6*(1), 111-126.

Taylor, G. J. (2001). Low emotional intelligence and mental illness. In J. Ciarrochi, & J. P. Forgas (Eds.), Emotional Intelligence in everyday life: a scientific inquiry.(PP.67-81). Philadelphia: Taylor & Francis.

Tsaousis, I., & Nikolaou, I. (2005). Exploring the relationship of emotional intelligence with physical and psychological health functioning. *Stress and Health, 21*(2), 77-86.

World Health Organization. (2010). Global recommendations on physical activity for health. http://whqlibdoc.who.int/publications/2010/9789241599979_eng.pdf. Accessed 30 January 2016.

World Health Organization. (2011). Malaysia Mental Health Country profiles. *Department of Mental Health and Substance Abuse, World Health Organization*. http://www.who.int/mental_health/evidence/ atlas/profiles /en/. Accessed 6 February 2016.