Association among Determinants of Physical Activity and Mental Health in Physiotherapy Students

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ABSTRACT

Aim: To explore the association among various parameters of physical activity and mental health in undergraduate physiotherapy students.
Methods: Mixed sample of female and male students (N=311) was evaluated on International Physical Activity Questionnaire (long form), Warwick-Edinburgh Mental Well-being Scale (WEMWBS), and Depression, Anxiety and Stress Scale (DASS-21). Categorical analyses within the scales were performed in addition to the statistical correlations among the parameters using Pearson's product–moment correlation.
Results: The mean scores for depression, anxiety, and stress states were 6.4±4.4, 7.4±4.3, and 7.5±4.1 respectively in students with average age of 21.7±1.8 years. The average total score for WEMWBS was 47.1±9.2. A significant positive correlation was observed between total MET*min and depression (P<0.05). Additionally, a significant negative correlation was found between the total MET*min and total WEMWBS score (P<0.05).
Conclusion: Many physiotherapy students reported poor psychological and emotional state with nearly one-third in "extremely severe" part of the anxiety continuum. Although overall mental wellbeing of these students was "average", a remarkable low percentage of students scored "above average" wellbeing. Significant correlation was present among various determinants of mental wellbeing, psychological health, and physical health.
Keywords: Physical activity, physiotherapy students, mental health, depression, stress, anxiety.

INTRODUCTION

The transition from college to university in pursuit of a professional academic degree could be challenging for the students. Literature has shown that owing to the demands of university life, the mental health and psychological state of the students is affected. These changes were also found to be associated with poor quality of life among students in professional study programs such as medicine, nursing, and pharmacy[1,2]. Another reason behind higher risk of poor mental health in the university students is that the common psychological issues that had been increasing during the adolescence would reach their highest point around the age of 25 years, which coincides with the age group of higher education students[3].

In addition to mental wellbeing, the psychological health of the university students is also negatively affected with respect to anxiety, depression, and stress. For example, a study on university students in the United States of America found that depression, anxiety, and stress was substantially high. These problems were higher in transfer students, those belonging to upper-class, and students not living on-campus. Major contributing factors to poor psychological health were academic performance, pressure to be successful, and plans after graduation[4]. Medical students in Pakistan are not immune to the higher academic and non-academic stresses of the university education. Considerably raised levels of depression and anxiety have been reported. Main risk factors identified were substance abuse, familial history, and loss of a relative in the prior year. Rather surprisingly, female medical students reported lower levels of stress compared to the male counterparts[5].

A comparative study of Egypt and Saudi Arabia also concluded that stress, anxiety and depression were frequently found in the medical students of both countries. Although frequency of stress was similar in both countries,

anxiety and stress were significantly lower in Saudi medical students[6]. Others have reported poor psychological health in Egyptian medical students as well. Stress was significantly correlated with depression and anxiety. Additionally, females were found to be at higher risk of stress compared to male students[7].

The positive relationship of physical activity (PA) with health – including mental health – is widely known. This is true for both general population as well students. For instance, the undergraduate students who participated more in physical activity reported significantly improved mental health in terms of depression and anxiety compared to those who were more sedentary. High PA group was significantly better than both medium and low PA groups while the latter two groups were statistically similar regarding depression. Two-thirds of the students scored low-to-medium in terms of PA[8]. Similarly, a study on female medical university students in Pakistan also demonstrated that physical activity levels of these students were considerable below the acceptable level of activeness and these levels did not improve significantly despite intervention[9].

There is paucity of literature regarding mental wellbeing of undergraduate physiotherapy students and how various determinants of mental wellbeing, psychological/emotional state, and physical activity correlate with each other. Therefore, the main purpose of the current cross-sectional study was to quantify the determinants of wellbeing, psychological state, and physical activity and evaluate the interplay among these parameters.

METHODS

This study involved a cross-sectional survey of undergraduate physical therapy students. To be eligible as a participant of the study, the age of the student must be

18-30 years and both male and female students were recruited to represent normal student population. Students who had recent history of musculoskeletal injury, diagnosis of mental disorder, or were pregnant at the time were excluded from the study. Ethical approval was obtained from the institutional review board and permission for data collection was achieved from the competent authority of a private-sector university. All students provided written, informed consent before their participation in the survey. Convenience sampling technique was used for the sample selection.

The shorter version Depression, Anxiety, and Stress Scale was used to evaluate the psychological and emotional state of the participants. The scale comprised 21 items, 7 for each of the domains. The DASS is a "quantitative measure of distress along the 3 axes of depression, anxiety, and stress" wherein anxiety is considered a symptom of psychological arousal and stress is taken as a more cognitive, subjective symptoms of anxiety[10]. The instrument evaluated the prevalence of depression, anxiety, and stress during last week on a 4-point Likert scale (0-3) where "0" signified that the statement "did not apply" and "3" indicated "very much, or most of the time". DASS is not meant for categorical assessment of clinical diagnosis and, for example, "mild" label in depression does not mean a mild level of disorder.

For assessing the mental wellbeing, Warwick-Edinburgh Mental Well-being Scale (WEMWBS) was used. WEMWBS was self-completed and comprised 14 items. The total score was calculated as a sum of the score for each item. The possible score for each item was from 1 - 5 and therefore the possible total score was from 14-70. The WEMWBS is a scale that measures mental wellbeing (as opposed to mental illness or disorder) and is suitable for use in the general population. The scale had shown high internal consistency with Cronbach's alpha value of 0.89 for the student sample and 0.91 for the population sample. Test-retest reliability at one week in the student sample had been high too (0.83)[11].

Physical activity during the prior one week was quantified with the long form of self-administered International Physical Activity Questionnaire (IPAQ). This instrument records physical activity spanning five domains (job-related, transportation, housework/house maintenance/caring for family, recreation/sport & leisure-time, and time spent sitting). The duration for each of these domains during last 1 week was converted to minutes. This time was multiplied with metabolic equivalent of task (MET) to obtain MET*minutes as outlined in the official scoring guideline[12].

Statistical analyses were performed with IBM SPSS 22.0 for Windows (IBM Corporation, New York, USA). Descriptive statistics were computed in terms of means, standard deviations, number and percentages (frequencies) of different parameters. Additionally, to explore the association among variables of mental health, wellbeing, and physical activity, Pearson's product–moment correlation coefficient was calculated after confirming the normality of data distribution. The level of significance was set at a P value of less than 0.05 for all analyses.

RESULTS

The mean age of the participants was 21.7±1.8 years with an average body mass index of 22.2±4.1 kg/m2. Females and males constituted 76.2% (N=237) and 23.8% (N=74) of the study participants. Based on WEMWBS scores, 6.1% (19) students had "very low mental wellbeing" while 13.5% (42), 74.9% (233), and 5.5% (17) had "below average", "average" and "above average" mental wellbeing respectively. The average overall score for WEMWBS was 47.1±9.2. The categorical scores for DASS-21 can be seen in Table-I. The mean scores for depression, anxiety, and stress states were 6.4±4.4, 7.4±4.3, and 7.5±4.1 respectively.

Table-I: Depression, anxiety, and stress classification of students [N (%)]

Severity continuum	Depression	Anxiety	Stress
Normal	117 (38)	63 (20)	162 (52)
Mild	58 (19)	50 (16)	49 (16)
Moderate	78 (25)	56 (18)	62 (20)
Severe	36 (12)	49 (16)	33 (11)
Extremely severe	22 (7)	93 (30)	5 (2)

A significant positive correlation was observed between total MET*min for the week and depression (P<0.05). Additionally, a significant negative correlation was found between the total MET*min for the week and total WEMWBS score (P<0.05). Recreational physical activity MET*min were also significantly positively correlated with stress (P<0.05). Detailed correlations are provided in the Table-II.

Table-II: Correlation coefficient and 2-tailed significance values for various parameters of physical activity, mental health and anthropometry.

	Variables	Pearson r	Sig. (2-tailed)
1	Total MET*min for the week vs. Depression	0.123	0.031
2	Total MET*min for the week vs. total WEMWBS	- 0.121	0.033
3	Total MET*min for the week vs. body mass index	0.153	0.007
4	Depression vs. Stress	0.704	0.000
5	Anxiety vs. Stress	0.774	0.000
6	Total WEBWMS score vs. Stress	- 0.112	0.049
7	MET*min for recreation-related PA vs. Stress	0.112	0.048
8	Sitting time in the week vs. Depression	0.156	0.006
9	Anxiety vs. Depression	0.708	0.000
10	Total WEBWMS score vs. Depression	- 0.274	0.000
11	MET*min for recreation-related PA vs. Anxiety	0.128	0.024
12	MET*min for home-related PA vs. Body mass index	0.123	0.030
13	MET*min for transport-related PA vs. Body mass index	0.121	0.033

DISCUSSION

The present study aimed to profile the undergraduate physiotherapy students in terms of emotional states of depression, anxiety, and stress. Additionally, the objective

of the study was to evaluate the mental wellbeing of the students and to seek the association among various parameters of psychological health, mental wellbeing, and physical activity.

According to the Health Survey England 2016, the mean WEMWBS score for age category 16-24 years was about 49.5, which is slightly above the mean score of 47.1 in the present study. It should be noted that both figures fall within "average" wellbeing[13]. According to cut-points recommended by National Health Services (NHS) of UK, 15.4% (48) students were seen as having "possible depression" and 19.6% (61) as having "probable depression". Only 5.5% (17) students were above the cut-point of 60 and above although this number should be approximately 15%. Similarly, a study in Ireland on the predominantly female sample of university students reported much higher values for mental wellbeing compared to the current study. Although the mean total score of the participants was not substantially higher than present study (49.7 vs. 47.1), more than 15% students were ranked "above average" in mental wellbeing compared to a meagre 5.5% presented here. The proportion of students who scored "average" was quite similar in the two studies[14].

Based on the 42-item version of the DASS, undergraduate university students (mean age: 20±2.6 years, 68.5% females) in Okinawa, Japan were reported to have average scores of 6.06 (7.16), 6.21 (6.55), and 7.42 (7.30) for depression, anxiety, and stress respectively. These scores are significantly lower than the converted scores of 12.8±8.8, 14.7±8.5, and 14.9±8.1 respectively in the current study[15]. A meta-analysis based on more than 62000 medical students to explore the prevalence of depression concluded that nearly one-third of the medical students showed signs of depression. It was also reported that depression was more common in female, middle-eastern, first-year and post-graduate students[16]. The depression states reported in the present study indicate much higher prevalence of emotional problems including depression.

Another systematic review on depression, anxiety, and distress in the medical students other than those in the North America reported the values of medical students suffering from depression, anxiety, and psychological distress as 6.0–66.5%, 7.7–65.5%, and 12.2–96.7% respectively. In the current study, 62% students belonged to mild – extremely severe state in terms of depression continuum of DASS. The figure was even higher for anxiety (80%)[17]. Based on a study of a female-dominant sample with an average age of 21.3 years (medical students) in Karachi, Pakistan, a vast majority (70%) of the students reported depression and anxiety. These values are quite similar to those reported here although the instrument utilized in the study was Aga Khan University Anxiety and Depression Scale rather than DASS[5].

In a comparative study between a medical university each from Saudi Arabia and Egypt, the proportion of Egyptian male medical students who exhibited depression, anxiety, and high stress level was 26.6%, 38.8%, and 30.9% respectively. On the other hand, although the stress levels were quite similar in the Saudi male students (28.9%), significantly lower percentage of students reported depression (16.2%) and anxiety (15.5%). The data was collected one month prior to the university examination to minimize the impact of exam-oriented stress. The instruments used in the study were Cohen's Perceived Stress Scale and the Hospital Anxiety and Depression Scale. Much higher proportion of students in the current study was placed higher on the severity continuum of depression, anxiety, and stress (5). Based on a similar sample (N = 374, females = 67%, age = 18-24 years), a study in Ohio, USA reported that 67%, 60%, and 62% of university students were "normal" on the continuum of depression, anxiety, and stress. On the contrary, much lower values of 38%, 20%, and 52% were found in the present study. Both studies have utilized the same instrument[4].

Significant correlation was found between overall physical activity as well as certain domains of physical activity with depression, anxiety and stress. Generally, one would anticipate better psychological and emotional state with higher levels of physical activity but that was not always true in the present study. It would be more understandable to find worse emotional state in students with more transport-related or home-related physical activity but, peculiarly, depression, anxiety, and stress were all significantly correlated with recreation-related physical activity. This finding warrants more studies to establish whether higher levels of recreational physical activity was in response to higher depression, anxiety, and stress. Contrary to expectations, the total WEMWBS score were also significantly negatively correlated with total physical activity MET*minutes in the past one week. In agreement with the present study, university students in Ireland also demonstrated negative correlation between total WEMWBS score and physical activity[14]. It can be speculated that higher physical activity levels shown in students with lower mental wellbeing was a coping strategy to relieve stress. More in-depth analyses are required to confirm this hypothesis.

One of the limitations of the current study is that contributing factors to mental wellbeing and psychological health were not recorded. Hence, it is difficult to predict the focal areas for intervention.

CONCLUSIONS

Quite high proportion of physiotherapy students reported poor psychological and emotional state with nearly one-third placed in the "extremely severe" part of the anxiety continuum. Although overall mental wellbeing of these students was "average", a remarkable low percentage of students scored "above average" wellbeing which is alarming and should be assessed and addressed appropriately. Significant correlation was present among various determinants of mental wellbeing, psychological health, and physical activity, which warrants further investigation.

REFERENCES

1. Ribeiro IJ, Pereira R, Freire IV, de Oliveira BG, Casotti CA., Boery EN. Stress and quality of life among university

students: A systematic literature review. Health Professions Education 2018; 4(2), 70-77.

2. Marshall LL, Allison A, Nykamp D, Lanke S. Perceived stress and quality of life among doctor of pharmacy students. American journal of pharmaceutical education 2008; 72(6).

3. Kessler RC, Amminger GP, Aguilar-Gaxiola S, Alonso J, Lee S, Ustun TB. Age of onset of mental disorders: a review of recent literature. Current opinion in psychiatry 2007; 20(4), 359.

4. Beiter R, Nash R, McCrady M, Rhoades D, Linscomb M, Clarahan M, Sammut S. The prevalence and correlates of depression, anxiety, and stress in a sample of college students. Journal of affective disorders 2015; 173, 90-96.

5. Khan MS, Mahmood S, Badshah A, Ali SU, Jamal Y. Prevalence of depression, anxiety and their associated factors among medical students in Karachi, Pakistan. Journal-Pakistan Medical Association 2006; 56(12), 583.

6. El-Gilany AH, Amr M, Hammad S. Perceived stress among male medical students in Egypt and Saudi Arabia: effect of sociodemographic factors. Annals of Saudi medicine 2008; 28(6), 442-448.

7. Fawzy M, Hamed SA. Prevalence of psychological stress, depression and anxiety among medical students in Egypt. Psychiatry research, 255 2017; 186-194.

8. Tyson P, Wilson K, Crone D, Brailsford R, Laws K. Physical activity and mental health in a student population. Journal of mental health 2010; 19(6), 492-499.

9. Memon AR., Masood T, Awan WA., Waqas A. The effectiveness of an incentivized physical activity programme (Active Student) among female medical students in Pakistan: A Randomized Controlled Trial. J Pakistan Med Assoc 2018; 68, 1438-1445.

10. https://www.blackdoginstitute.org.au/wp-content/uploads/2020/04/Dass-21.doc (accessed 23.11.2020)

11. Tennant R, Hiller L, Fishwick R, Platt S, Joseph S, Weich S, Stewart-Brown S. The Warwick-Edinburgh mental well-being scale (WEMWBS): development and UK validation. Health and Quality of life Outcomes 2007; 5(1), 63.

12. IPAQ Research Committee. (2005). Guidelines for data processing and analysis of the International Physical Activity Questionnaire (IPAQ)-short and long forms. http://www. ipaq. ki. se/scoring. pdf.

13. http://healthsurvey.hscic.gov.uk/media/63763/HSE2016-Adult-wel-bei.pdf (accessed 23.11.2020)

14. Davoren MP, Fitzgerald E, Shiely F, Perry IJ. Positive mental health and well-being among a third level student population. PLoS One 2013; 8(8), e74921.

15. Ratanasiripong P, China T, Toyama S. Mental Health and Well-Being of University Students in Okinawa, Education Research International, Vol. 2018, 7 pages.

16. Puthran R, Zhang MW, Tam WW, Ho RC. Prevalence of depression amongst medical students: A meta-analysis. Medical education 2016; 50(4), 456-468.

17. Hope V, Henderson M. Medical student depression, anxiety and distress outside North America: a systematic review. Medical education 2014; 48(10), 963-979.