

# Anxiety, Depression, Physical Activity and Quality of Life in Student Physical Therapists: A Cross-sectional Study

Figen Koçyiğit<sup>1\*</sup>, Emel Dikbas Torun<sup>2</sup>, Ümmuhan Bas Aslan<sup>1</sup>

<sup>1</sup>Pamukkale University, School of Physical Therapy and Rehabilitation, Denizli, Turkey

<sup>2</sup>Pamukkale University, Faculty of Communication, Denizli, Turkey

\*Corresponding author: figen7876@yahoo.com

**Abstract Background:** Psychological well-being among college students around the world is a current research topic. Despite various number of studies focusing on students who are trained for being a health care specialist, there are no reports on psychological disorders of student physical therapists. The objective of this study is to determine the prevalence of depression and anxiety among student physical therapists and to analyse any possible effects of different parameters on depression and anxiety. **Methodology/Principal findings:** 158 grade 2 and grade 3 students were enrolled in the study. Beck's depression inventory (BDI), Beck's anxiety inventory (BAI), Nottingham Health Profile (NHP), International Physical activity Questionnaire (IPAQ) were used as evaluation measures. The mean age of the participants were 21.8±1.5 years. 18.9% of the students (n=30) had mild, moderate or severe depression. 40.5% of the students (n=64) had mild, moderate or severe anxiety. Only 10.8% of the participants (n=17) were inactive according to IPAQ scores. Female gender was correlated with higher BAI scores. Academic grade was not correlated with evaluation scores. **Conclusions:** The prevalence of anxiety and depression in student physical therapists was high, similar to the other health care professionals. These psychological disorders could influence the academic attainment. Therefore preventive measures and coping strategies may be implemented as an integral part of college education.

**Keywords:** health occupations student, gender role, anxiety, depression, academic grade

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## 1. Introduction

A physical therapist is a health care professional who specialises in maximising human movement, and function. Physical therapists work to improve movement and promote health and wellbeing. To become a physical therapist in Turkey, someone should graduate from a school of physical therapy and rehabilitation. The entrance requirement to the School of Physical Therapy and Rehabilitation is completion of Turkish upper secondary level education (total 11 years) or completion of corresponding studies abroad and attaining the required score in the national university exam.

The physical therapy and rehabilitation undergraduate program consists of a four-year curriculum that includes academic, clinical and research experience. The academic portion of curriculum full-time over three years, including clinical practices in second and third years summer semesters. The fourth year is designed to include both a full-time clinical internship in various rehabilitation settings.

Every year in fall semester undergraduate physical therapy students are welcomed in School of Physical Therapy and Rehabilitation at Pamukkale University.

Once enrolled students and the school make a mutual commitment intended to train knowledgeable, competent and socially useful physical therapists who are equipped to care for the patients needing physical therapy.

Increased attention has been directed to the psychological well-being among college students around the world [1,2]. Recent studies especially focus on students who are trained for being a health care specialist [3,4].

Boalshamat et al. aimed to assess the psychological well-being among medical and dental students in Saudi Arabia. They reported that medical and dental students had high levels of depression, anxiety and stress, and normal levels of self-efficacy and satisfaction with life [3]. A recent review reported a high prevalence of depression and anxiety among medical students [5]. Another review revealed that undergraduate nursing students may suffer from anxiety, anguish and emotional breakdown [4].

High levels of anxiety and prevalence of depression may affect cognitive function and interfere with learning. In many schools of Physical therapy and rehabilitation, the authoritarian and rigid educational course encourages competition rather than cooperation between students. Together with the intense and extensive academic content, the prevalence of emotional disturbance may increase when compared to general population.

Epidemiological data about psychological well-being of student physical therapists is scarce. Up to our knowledge, no previous studies investigated psychological well-being of undergraduate physical therapists. The present study was therefore aimed to determine the prevalence depression and anxiety among student physical therapists and to analyse any possible effects of gender, academic year, perceived quality of life and physical activity on depression and anxiety.

## 2. Materials and Methods

This is a cross-sectional study conducted in Pamukkale University which is a public university in the province of Denizli. School of Physical Therapy and Rehabilitation is one of the most preferred physical therapy schools in Turkey, according to university exam results. The permission of school coordinator was obtained to conduct the research. All of the participants gave written and oral informed consent.

### 2.1. Participants

All of the preclinical (grade 2-3) students (n:200) were invited for participation in the study. The students were contacted during the examination free third week of the first semester of 2014-2015 academical year. Of the 200 invited students, 42 declined the invitation, and 158 students were enrolled. Each student received a questionnaire, a consent for participation and the evaluation form (Beck's Depression Inventory, Beck's Anxiety Inventory, Nottingham Health Profile, International Physical Activity Questionnaire-short Form). The students were requested to respond in their own time and privacy. The responded questionnaires and signed consent forms were returned within one week and included mobile phone to contact for any missing information. Data collection was finished two weeks before the midterm examination period so that the actual examination stress would not affect the response of students.

### 2.2. Evaluation Measures

The demographical parameters and academic grade were investigated by the questionnaire.

Beck's Depression Inventory (BDI) was used to assess depression. BDI was developed by Aaron Beck in 1972 [6]. BDI is a 21-question multiple-choice self-report inventory that is one of the most widely used instruments for measuring the severity of depression. BDI was revised in 1996 in response to the American Psychiatric Association's publication of the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, which changed many of the diagnostic criteria for Major Depressive Disorder. Each answer is being scored on a scale value of 0 to 3. The total score ranges between 0-63. Higher total scores indicate more severe depressive symptoms. The standardized cutoffs are classified as follows: 0-13: minimal depression, 14-19: mild depression, 20-28: moderate depression, 29-63: severe depression [7].

Beck's Anxiety Inventory (BAI) was used to evaluate anxiety. BAI was also developed by Aaron Beck in 1988. BAI consists of 21 questions about how the subject has been feeling in the last week, expressed as common

symptoms of anxiety. It is designed for an age range of 17-80 years old. Each question has the same set of four possible answer choices, which are arranged in columns and are answered by marking the appropriate one with a cross. The total score ranges between 0-63. Test scores are classified as follows 0-7: minimal level of anxiety, 8-15: mild anxiety, 16-25: moderate anxiety, 26-63: severe anxiety [8].

The quality of life was evaluated by Nottingham Health Profile (NHP). NHP is a self-administered questionnaire that is used to determine and quantify perceived health problems. It is divided into 6 subscales (sleep, mobility, energy, pain, emotional reactions, social isolation) and consists of 38 items [9].

The international physical activity questionnaire short form (IPAQ) is an instrument designed primarily for population surveillance of adults. It has been developed and tested for use in adults. We used IPAQ to evaluate the physical activity level of our participants. Both categorical and continuous indicators of physical activity are possible from the IPAQ. The continuous indicator was preferred in our study. The continuous indicator is presented as median minutes or median MET-minutes/week. Total weekly time spent walking, and in moderate-intensity or vigorous-intensity activity is calculated by multiplying the number of days/week in each category by the duration on an average day. Minutes per week in each category are multiplied with metabolic equivalents [MET; which reflect multiples of resting energy expenditure specific to walking (3.3 METs), moderate (4 METs) and vigorous (8 METs) intensity activities] resulting in a physical activity estimate expressed in total MET-minutes/week. The continuous indicator is classified as inactive, minimally active (a minimum of at least 600 MET-min/week) and Hepa active (a minimum of at least 3000 MET-minutes/week) [10].

### 2.3. Statistical Analysis

Statistical analysis was performed with SPSS software, release 21.0 (SPSS Inc., an IBM Company, and Chicago, IL, USA). Standard descriptive statistics was used to summarize characteristics of the participants including means and standard deviations (SD) of all continuous variables and counts and percentages for the categorical variables. A Spearman correlation test was performed to analyse the correlation of gender and BAI, BDI, NHP and IPAQ scores. A Spearman correlation test was performed to analyse the correlation of academic grade and BAI, BDI, NHP and IPAQ scores. We defined two-sided statistical significance as  $p < 0.05$ .

## 3. Results

A total of 158 students were enrolled in the study. The mean age of the participants were  $21.8 \pm 1.5$  years (range 18-31 years). 51.3% of the participants were males (n=81), 48.7% of the participants were females (n=77). 51.9% of the participants were grade 2 (n=82), 48.1% were grade 3 (n=76).

The mean BDI scores were  $8 \pm 6$  (range 0-27). 18.9% of the students (n=30) had mild, moderate or severe depression. The mean BAI score was  $8 \pm 7$  (range 0-33). 40.5% of the students (n=64) had mild, moderate or severe

anxiety. Table 1 shows the distribution of depression, anxiety and physical activity level according to grades.

The mean NHP score was  $76.03 \pm 73.4$  (range 0-328.7). The mean IPAQ score was  $2512 \pm 2230$  MET-minutes/week (range 0-12213 MET-minutes/week). 17 participants were inactive (10.8%), 99 participants were minimally active (62.7%) and 42 participants were HEPA active (26.6%). Table 2 shows the mean BDI, BAI, NHP and IPAQ scores according to gender and academic grade.

When grade 2 students were compared with grade 3 students according to age, gender, BAI, BDI, NHP, IPAQ scores; age ( $p < 0.001$ ) and IPAQ scores ( $p = 0.33$ ) were significantly different between the groups. Grade 2 students' physical activity level was significantly higher than grade 3 (2973 vs. 2016 MET-minutes/week,  $p = 0.004$ ).

**Table 1. Distribution of depression, anxiety and physical activity level according to grades**

	Grade 2 (n=82)	Grade 3 (n=76)	Total (n=158)
<b>Anxiety</b>			
Mild	27	25	52
Moderate	10	6	16
Severe	3	1	4
Total	40	32	72
<b>Depression</b>			
Mild	15	8	23
Moderate	3	4	7
Severe	0	0	0
Total	18	12	30
<b>IPAQ</b>			
Inactive	9	9	18
Minimally active	43	54	97
HEPA active	30	13	43
Total	82	76	158

When the male participants were compared to female participants according to age, BAI, BDI, NHP, IPAQ scores; IPAQ scores were significantly higher in males (2964 vs. 2037 MET.min/week,  $p = 0.006$ ) and BAI scores were significantly higher in females ( $p = 0.031$ ).

**Table 2. Distribution of mean BAI, BDI, IPAQ, NHP scores according to academic year and gender**

	BAI score	BDI score	IPAQ	NHP total score
Grade 2 (n=82)	8.4±6.9	8.5±5.9	2973±2516	83.9±78.7
Grade 3 (n=76)	7.7±6.3	8.4±6.9	2016±1473	67.5±66.1
P value	0.47	0.34	<b>0.004</b>	0.16
Female (n=77)	9.2±7.1	8.8±6.2	2037±1855	81.21±75.72
Male (n=81)	7±5.9	7.3±5.8	2966±2281	71.1±71.26
P value	<b>0.031</b>	0.14	<b>0.006</b>	0.39

There was a strong positive correlation between female gender and BAI scores;  $r_s = 0.17$ ,  $p = 0.031$ . There was a strong positive correlation between male sex and IPAQ scores;  $r_s = 0.263$ ,  $p = 0.006$ .

## 4. Discussion

This is the first study that investigated the presence of depression and anxiety among undergraduate physical therapists. We also analysed the association of academic grade and gender with BAI, BDI, NHP, IPAQ scores. We documented that both depression and anxiety were highly prevalent in student physical therapists when compared to

the general population. The high BAI scores were correlated with female gender, and high IPAQ scores were correlated with male gender. Academic grade seems not to affect anxiety and depression, according to our results.

The BDI is a well-established questionnaire to screen for depression [6]. It has been also validated for use in a nonpsychiatric population including general population, college students and medical students [11-13]. Nyenhuis et al. reported a mean BDI score of  $6.8 \pm 5.5$  for general population [13]. Our study group had a higher BDI mean score when compared to general population. Tjia et al. reported the prevalence of depression as 15.2 % in medical students. However, another current research on medical and dental students reported depression prevalence as 69.9 % [3]. The prevalence of mild, moderate and severe depression was 18.9 % in our study.

Feng et al. reported the prevalence of anxiety as 7.6 % in a large cross-sectional study including 1106 college students [15]. Lloyd et al. reported high mean anxiety scores when compared to the general population in both dental and medical students [16,17]. O'Donnell et al. reported prevalence of self-reported anxiety to be 9.4 % identified from Canadian community health Survey System [18]. According to our results, 40.5% of the student physical therapist (n=64) had mild, moderate or severe anxiety, which is higher compared to reported general population prevalence.

Academic pressure, workload, financial concerns, exposure to suffering patients, sleep deprivation have been hypothesized to contribute to the high prevalence of anxiety and depression in medical students [5]. All these factors may also be blamed for increased psychological distress among student physical therapists. Moreover anxiety and especially depression may adversely influence the students' academic performance and ultimately affect patient care during the internship and after graduation.

Abdulghani et al. investigated the prevalence of stress and its relation to academic grade in medical students. They reported that stress significantly decreased as the academic year increased except for the final year. They reported that stress was higher in first three years and among the female students [19].

The NHP has been used to evaluate perceived health status in a variety of clinical condition. Mean total NHP score of the random population was reported to be 130 [20]. The total NHP score of our study group is relatively low which can be explained by the younger age of our participants. Likewise, life satisfaction and self-efficacy of medical students was reported to be normal by Aboalshamat et al. [3].

Physical activity level of university students was investigated extensively in literature, and recent reviews reported a high prevalence of physical inactivity [21,22]. Similarly, in a study of university students from 23 countries the prevalence of physical inactivity ranged from 23 to 39 % in western countries, to 42 % in Pacific Asian, and 44 % in developing countries [23]. However, there are no studies on physical activity levels of physical therapy students to the best of our knowledge. Only 10.8% of physical therapy students were classified as inactive according to IPAQ scores in our study. Moreover, 26.6% were HEPA active. Our data shows that student physical therapist are more active physically than the other college studies. This high physical activity level may be explained

by the nature of their education period. The importance of physical activity is emphasized from the first day of their education until they graduate. This may positively affect the students physical activity level.

There was no correlation between academic year and BAI, BDI, NHP scores. However, grade 2 students' IPAQ scores were significantly higher than grade 3 ( $p=0.003$ ). The different physical activity levels between academic year may be explained by the intensity of the educational content at the third school year.

Female gender was significantly correlated with higher anxiety levels. Women in the general population have a higher lifetime risk of anxiety than men [24]. Lloyd reported higher anxiety in female medical students compared to male colleagues. Hojat et al. reported similar findings. They conducted a cross-sectional study on 1157 medical students to compare male and female medical students on selected personality attributes. They reported that female students had significantly higher general anxiety and test anxiety levels when compared to males [25]. Our results support these studies. Our data implies that female gender may be a risk factor for increased anxiety in student physical therapists.

The cross-sectional design of our study is a limitation. The evaluation measures were self reported which may arise reporting bias. Participants' interpretation of questions or desire to hide their emotions may arise this potential reporting bias. Longitudinal studies may be carried out to prevent bias. We included grade 2 and 3 students in our study. Further studies investigating anxiety and depression levels in all the four years of undergraduate physical therapists are needed.

## 5. Conclusions

Our data suggests that the prevalence of anxiety and depression was higher in undergraduate physical therapists despite their high physical activity level. Anxiety, depression and quality of life were not correlated with the academic year. However gender affected both the anxiety and physical activity levels significantly. Student physical therapists, similar to the other health care professionals, may experience anxiety and depression. These psychological disorders could influence their academic attainment and personal success. Therefore preventive mental health services and coping strategies may be implemented as an integral part college education.

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