

# ASSOCIATION BETWEEN NECK PAIN AND DEPRESSION, ANXIETY, AND STRESS AMONG IIUM Kuantan STUDENTS

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## ABSTRACT

**Background:** Neck pain is a common disorder worldwide due to degenerative changes in facet joints and the collapse of intervertebral discs. The incidence of neck discomfort is significantly higher in older people. Psychological distress refers to generic stress, anxiety, and depression symptoms. High levels of psychological distress indicate poor mental health and may be indicative of prevalent mental disorders. The main objective of this study was to evaluate the association between neck pain and psychological distress among International Islamic University Malaysia (IIUM) Kuantan students. **Methods:** 83 subjects were selected through the convenience sampling method following the inclusion and exclusion criteria. Neck Disability Index (NDI) and the Depression Anxiety Stress Scales 21 (DASS-21) were used to determine the level of neck pain, depression, anxiety, and stress, respectively. Descriptive statistics and the Chi-square test of independence were applied to analyse the data. **Result:** 68.6% of the students suffered from mild to moderate neck disability. More than half of the students suffered from depression, anxiety, and stress, with the percentage of 59.1%, 79.0% and 43.5%, respectively. The result showed a significant association between neck pain and depression ( $p=0.006$ ), anxiety ( $p=0.023$ ), and stress ( $p=0.023$ ). **Conclusion:** IIUM students demonstrated mild to moderate neck pain and high levels of depression, anxiety, and stress with a significant association between them. It is hoped that this study brings awareness of maintaining good physical and mental health among students and how it correlates with each other.

## Keywords:

Neck pain, depression, anxiety, stress, IIUM Kuantan students

## INTRODUCTION

Poor posture, sedentary lifestyle and academic stress are among the factors that are associated with neck pain and psychological stress among students. Although the burden of neck pain has not increased significantly from 1990 to 2019, its high prevalence means that it affects a significant number of people around the world. Psychological factors contribute to the onset of neck discomfort (Kazeminasab et al, 2022). According to Al-Ghamdi et al. (2022), the combination of neck pain with psychological issues was substantially associated with the population. In other studies, there is evidence that adolescents' high levels of psychological distress contribute to their musculoskeletal complaints (Liu et al., 2018).

Awareness campaigns and initiatives aimed at enhancing mental health have been carried out during the preceding years. It is common knowledge that keeping excellent mental health helps reduce the likelihood of developing musculoskeletal diseases like neck pain. This is one of the

reasons why many of us are aware of the benefits of doing so. Having many assignments and remaining focused while working on a laptop, on the other hand, can contribute to an increased likelihood of experiencing stress, depression, and anxious feelings, as well as increasing the level of neck pain. As a result, it is essential to acquire knowledge concerning depression, anxiety, and stress levels to enhance one's physical health and avoid developing neck pain. Indirectly, we can assert that there is a significant association between pain in the neck and psychological distress.

Therefore, the study intended to address the level of depression, stress, and anxiety among IIUM Kuantan students and its association with the level of neck pain. It is vital to accomplish this goal because it can give students the ability to control their mental health as well as prevent the development of musculoskeletal diseases such as neck pain.

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## **MATERIALS AND METHODS**

### **Study Design**

The study was using a cross-sectional study design and information gathered from specific populations in a specific period.

### **Subjects**

The study was conducted at the International Islamic University Malaysia (IIUM), Kuantan Campus. The questionnaires were distributed online using Google Forms. The targeted population was students at IIUM Kuantan. The study's inclusion criteria were undergraduate IIUM Kuantan students aged 18 to 30 who understand the English language. Students with pathological conditions associated with the neck and who are taking drugs for anxiety, depression, or stress are excluded from this study.

### **Ethical Consideration**

The study obtained approval from the Kulliyah Postgraduate and Research Committee (KPGRC) (Reference Number: IIUM/310/14/11/2 ID Number: KAHS 92/23). The respondents were informed about the study's objectives and consented to participate.

### **Sample Size Calculation**

The sample size was calculated using a single proportion formula, with a confidence interval of 95% and a precision of 10%. Participants' withdrawal from the study is expected, and an additional 10% for incomplete data is added to the sample size. From the sample size calculation, the sample size for this study was about 82 students.

### **Sampling Method**

The samples were collected using convenience sampling. The subject's demographic data, including Kulliyah, Year of Study, Age and Gender, were recorded. The subject must meet all the inclusion and exclusion criteria of the study to proceed. Then, the subjects needed to answer a set of questionnaires consisting of three parts: demographic data, a Neck Disability Index (NDI) by Vernon (2008) and the Depression Anxiety Stress Scales 21 (DASS-21) by Lovibond & Lovibond (1995). NDI is used to analyse the level of neck pain. A total of ten inquiries pertaining to neck pain were presented. The severity of neck pain can be assessed by combining the cumulative scores. The total scores of the NDI accumulated to 50. The levels of NDI encompass a range of disability severity, including no disability, mild disability, moderate disability, severe disability, and complete impairment. DASS-21 is a collection of three self-report measures specifically developed to assess individuals, levels of three psychological distress, including depression, anxiety, and stress. It consists of seven items per scale; in total, there

will be 21 questionnaires. The scoring for DASS-21 can be calculated by summing up the score for each category. There were five different labels of severity of depression, anxiety and stress, which are normal, mild, moderate, severe, and extremely severe.

### **Statistical Analysis**

The statistical analysis data was done by using the Statistical Package for Social Science (SPSS) version 27 for Windows. Demographic data was analysed by using descriptive statistics. Both levels of neck pain and depression, anxiety and stress were reported using descriptive statistics. The level of neck pain can be divided into no disability, mild disability, moderate disability, and severe disability. The score is calculated by summing up the score for each question. The level of anxiety was determined by calculating the sum of the questions of numbers 2, 4, 7, 9, 14, 19 and 20 in DASS-21 and was categorised into normal, mild, moderate, severe and extremely severe. For anxiety, a total score of 0-3 is classified as normal level, scores 4-5 are classified as mild anxiety, scores 6-7 are classified as moderate anxiety, scores 8-9 are classified as severe anxiety and extremely severe anxiety when the total score is 10 and above. The level of depression was determined by calculating the sum of the questions of numbers 3, 5, 10, 13, 16, 17 and 21 in DASS-21, and was categorised into normal, mild, moderate, severe and extremely severe. For depression, a total score of 0-4 is classified as normal level, scores 5-6 are classified as mild depression, scores 7-10 are classified as moderate depression, and scores 11-13 are classified as severe depression and for extremely severe depression when the total score is 14 and above. For the association of neck pain and depression, anxiety and stress were demonstrated using the Chi-Square test of independence.

## **RESULTS AND DISCUSSION**

### **Demographic data**

The study comprised 83 respondents who provided consent and participated, consisting of 12 males (14.5%) and 71 females (85.5%). Most of the respondents were within the age range of 21-23 years old. Approximately 41.0% of the participants were in the 18-20 age group, with an additional 2.4% representing the 24-26 age group. Among the six Kulliyah at IIUM Kuantan, only five participated in the study. KAHS got the highest response rate at 39.8%, followed by KOS (24.1%), KOM (20.5%), KOD (10.8%), and lastly, KON (4.8%).

The most represented academic year was Year 4, with 38.6% of the respondents. Years 2 and Year 1 shared almost similar percentages, each at 24.1% and 22.9%, respectively. Year 3 secured the fourth position with 12%, while Year 5 occupied the last position with 2.4%. Table 4.1

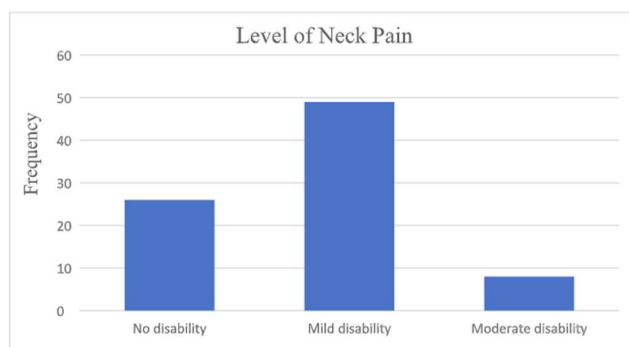
presents a summary of the characteristics of the respondents according to each variable.

**Table 1** Characteristics of the respondents (n=83)

Variable	Frequency	Percentage (%)
Gender:		
Male	12	14.5
Female	71	85.5
Age:		
18-20	34	41.0
21-23	47	56.6
24-26	2	2.4
Kulliyah:		
KAHS	33	39.8
KOS	20	24.1
KOM	17	20.5
KOD	9	10.8
KON	4	4.8
Year of Study:		
Year 1	19	22.9
Year 2	20	24.1
Year 3	10	12.0
Year 4	32	38.6
Year 5	2	2.4

### Level of Neck Pain

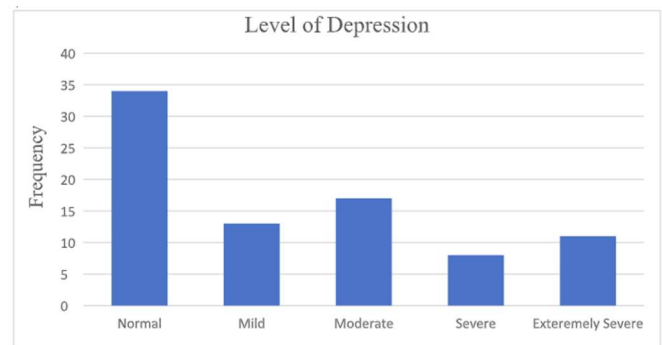
The results show that 49 students had a mild disability in the neck (59.0%), followed by no disability with 26 students (31.3%), and moderate disability in the neck with eight students (9.6%). Figure 1 summarises the level of neck pain among IIUM Kuantan students.



**Figure 1** Level of Neck Pain among IIUM Kuantan students (n=83)

### Level of Depression

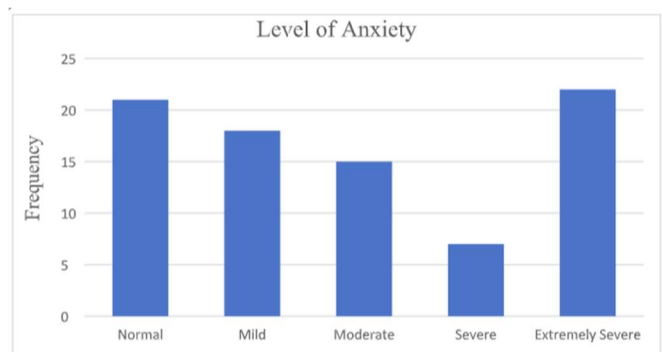
In terms of depression level, most of the respondents had a normal level of depression, with 34 students (41.0%), followed by moderate depression with 17 students (20.5%), mild depression with 13 students (15.7%), extremely severe depression with 11 students (13.3%) and severe depression with 8 students (9.6%). Figure 2 shows the level of depression among IIUM Kuantan students.



**Figure 2** Level of Depression among IIUM Kuantan students (n=83)

### Level of Anxiety

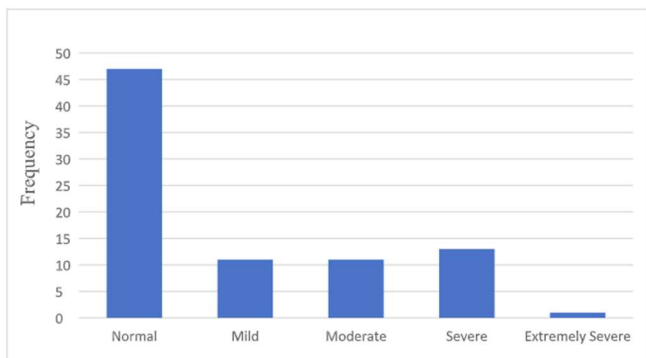
In terms of anxiety level, most of the respondents had extremely severe anxiety with 22 students (26.5%) followed by normal level with 21 students (25.3%), mild anxiety with 18 students (21.7%), moderate anxiety with 15 students (18.1%) and severe anxiety with 7 students (8.4%). Figure 3 shows the level of anxiety among IIUM Kuantan students.



**Figure 3** Level of Anxiety among IIUM Kuantan students (n=83)

### Level of Stress

In terms of stress level, most of the respondents had a normal level of stress, with 47 students (56.6%), followed by severe stress with 13 students (15.7%); mild stress and moderate stress share the same number of students, 11 students each (13.3%). Only one student has extremely severe stress (1.2%). Figure 4 shows the level of stress among IIUM Kuantan students.



**Figure 4** Level of Stress among IIUM Kuantan students (n=83)

**Table 4:** Association of Neck Pain and Stress Level (n=83)

Variable	Level of Neck Pain			Total n (%)	$\chi^2$	d f	p-value
	No disability (%)	Mild disability (%)	Moderate disability (%)				
<b>Level of Stress</b>							
Normal	20 (42.6)	26 (55.3)	1 (2.1)	47 (100)	15.688	8	0.023
Mild	2 (18.2)	8 (72.7)	1 (9.1)	11 (100)			
Moderate	3 (27.3)	6 (54.5)	2 (18.2)	11 (100)			
Severe	1 (7.7)	8 (61.5)	4 (30.8)	13 (100)			
Extremely Severe	0 (0.0)	1 (100)	0 (0.0)	1 (100)			
Total	26	49	8				

### Association of Neck Pain and Depression

The association between neck pain and depression was analysed using the Chi-square test for independence. A significant association was found, with a  $p$ -value lower than  $\alpha$  ( $p=0.006$ ).

**Table 2:** Association of Neck Pain and Depression Level (n=83)

Variable	Level of Neck Pain			Total n (%)	$\chi^2$	d f	p-value
	No disability (%)	Mild disability (%)	Moderate disability (%)				
<b>Level of Depression</b>							
Normal	17 (50.0)	17 (50)	0 (0.0)	34 (100)	18.793	8	0.006
Mild	2 (15.4)	10 (76.9)	1 (7.7)	13 (100)			
Moderate	5 (29.4)	9 (52.9)	3 (17.6)	17 (100)			
Severe	1 (12.5)	4 (50.0)	3 (37.5)	8 (100)			
Extremely Severe	1 (9.1)	9 (81.8)	1 (9.1)	11 (100)			
Total	26	49	8				

### Association of Neck Pain and Anxiety

On the association of neck pain and anxiety, the statistical analysis is shown in Table 3. There is a significant association found between neck pain and anxiety level, with a  $p$ -value lower than  $\alpha$  ( $p=0.023$ ).

**Table 3:** Association of Neck Pain and Anxiety Level (n=83)

Variable	Level of Neck Pain			Total n (%)	$\chi^2$	d f	p-value
	No disability (%)	Mild disability (%)	Moderate disability (%)				
<b>Level of Anxiety</b>							
Normal	9 (42.9)	12 (57.1)	0 (0.0)	21 (100)	16.473	8	0.023
Mild	8 (44.4)	10 (55.6)	0 (0.0)	18 (100)			
Moderate	5 (33.3)	9 (60.0)	1 (6.7)	15 (100)			
Severe	2 (28.6)	3 (42.9)	2 (28.6)	7 (100)			
Extremely Severe	2 (9.1)	15 (68.2)	5 (22.7)	22 (100)			
Total	26	49	8				

### Association of Neck Pain and Stress

On the association of neck pain and stress, the statistical analysis is shown in Table 4 for a confidence level of 95%, the  $p$ -value was compared with the significance level ( $\alpha$ ) of 0.05. Therefore, there is a significant association found between neck pain and stress level, with a  $p$ -value lower than  $\alpha$  ( $p=0.023$ ).

According to Chan et al. (2020), in the study, 60% of 1003 respondents consisting of undergraduate students in Hong Kong reportedly had neck pain. The statement from that study was parallel to the outcome found in IIUM Kuantan students where 68.6% of undergraduate students combined had mild and moderate disability of the neck. Several factors, including prolonged use of smartphones, sports injuries, study hours and mental health levels, can cause neck pain in students. A study from China reported that study time of more than six hours, flexed neck posture of more than 20 degrees, static duration posture of more than two hours and psychological distress are independent factors for neck pain in female students (Zheng et al., 2022). One of the categories of neck pain is mechanical neck pain. Mechanical pain originates in the spine or its supporting structures, such as ligaments and muscles (Cohen, 2015). Common examples of mechanical pain include pain arising from the facet joints, discogenic pain, and myofascial pain. Gull et al. (2021) concluded that university students have a higher risk of developing mechanical neck pain.

The term depression describes a wide range of emotional lows, from mere sadness to a pathological suicidal state (Naushad et al., 2014). People with this mental illness often have a lot of stress in their daily lives. For depressed people, their sadness or unhappiness lasts for a very long time because they are unable to find the real reason why they should be happy. The person may stop their social activities and be more likely to be alone. However, people who are mentally stable, will get better with sadness for a suitable amount of time and continue life as usual. Depression in young individuals frequently accompanies other mental diseases, including anxiety, disruptive behaviour, or substance addiction disorders (Weissman et al., 1999 as cited in Naushad et al., 2014). Among 83 students, the prevalence of depression was found to be 59.1%. As compared to the other study conducted in Borneo, their study found that 82% of the students struggle with depression (Zulkafli et al, 2022). A study conducted in Selangor found that 53.9% of the students

had moderate to severe depression (Wong et al., 2023). Students were more likely to have depression as the previous studies shared similar results with the current study. Students tend to develop depression due to low self-esteem, peer problems and traumatic events (WHO, 2023). Traumatic events among students can include being scolded by teachers or physically abused by friends. The most common types of depression found in this study were moderate depression (20.5%), followed by mild depression (15.7%), extremely severe depression (13.3%) and severe depression (9.6%). A cross-sectional study conducted in Malaysia in 2011 found that moderate depression was the most common one found among Malaysian students (Shamsuddin et al., 2011).

Anxiety is characterised by persistent intrusive thoughts and concerns that result in perpetual worry and tension. In a similar fashion, anxiety has also been described as having a disproportionate amount of worry and fear relative to everyday situations, which leads to adverse thoughts and predictions about future events (Tan et al., 2023). In university, especially for those who studied far from their hometown, their anxiety will be increased due to financial factors, and challenges in meeting new environments and people. 79.0% of students had anxiety in this present study. This was higher compared to the study conducted among 16 universities in Malaysia, the prevalence risk was recorded at 29% where 529 out of 1821 students had anxiety (Mohamad et al., 2021). According to the authors, the academic year, getting money for the study, drinking alcohol, getting bad sleep, body mass index (BMI), having a good friend at university, unsure future, being involved in society, and having a problem with other students and lecturer were all found to be significantly linked to and indicate the risk of anxiety in that study. Most of the respondents who have anxiety had extremely severe anxiety (26.5%), followed by mild anxiety (21.7%), moderate anxiety (18.1%) and severe anxiety (8.4%). The study found that university students in Selangor, Malaysia, showed the same trend as the current study, with extremely severe anxiety (32.7%) being the highest among people who have anxiety (Wong et al., 2023).

Stress can arise from various factors in daily life, such as work, personal, social, and financial factors. It is a state of emotional instability that impairs someone's capacity to consistently focus and perform successfully. It reduces a student's efficiency in doing tasks and learning new knowledge. they encounter significant and demanding difficulties during their academic journey and youthful activities (Qamar et al., 2015). Studies showed that academic stress is the most common factor of stress among college students (Pozos-Radillo et al., 2014). Half of the respondents in the study had stress (43.5%). Students

tend to develop stress due to assignments, presentations, and examinations. A study conducted among Malaysian students at university showed that the prevalence rate of perceived stress among undergraduate students was 37.7% (Jia & Loo, 2018). The other study conducted in Selangor found that 44.6% of university students had moderate to severe stress (Wong et al., 2023). It can be concluded that Malaysians suffer from stress, especially among university students, as the other study shared almost similar results from current study. A current study shows most students who have stress have severe stress (15.7%). Mild and moderate levels of stress shared the same number of respondents which are 11 each (13.3%), then followed by extremely severe stress (1.2%). Severe stress can affect academic performance. However, medical students in top universities in Malaysia showed that their academic performance is not affected by stress as the medical school trains the students to face everyday challenges and manage stress well (Siraj et al., 2014). Therefore, it is necessary for educational institutions to conduct programmes related to stress management.

There was a significant association between neck pain and depression, anxiety, and stress. This finding was consistent with other studies that have reported anxiety and depression were found to be major contributors to neck pain among students in Saudi Arabia (Alghamdi et al., 2023). The study did not specify if stress can contribute to neck pain or not. Another study found a strong link between stress and neck disability during the COVID-19 lockdown period among students, with stressed individuals having a significantly higher relation of suffering moderate to severe neck pain limitations (Daher & Halperin, 2021). High amounts of stress can significantly affect the neck as stress will strain the muscles around it. In another study conducted in Pakistan, they found that neck pain is associated with depression and stress (Batool et al., 2022). Individuals in Germany with symptoms of depression or anxiety were found to have a strong association with experiencing severe neck pain (Blozik et al., 2009).

From all the previous studies, depression was consistently the contributor to neck pain. In the meta-analysis study, out of 33 risk factors of neck pain, 11 risk factors have been listed as the main risk factors, including emotional issues (Gao et al., 2023). It shows that there is an association between neck pain and depression, stress and anxiety, as many other studies share similar results. There was a little study about the relationship between neck pain and depression, anxiety and stress in the Malaysian community. A previous study found that psychological distress was associated with musculoskeletal pain such as shoulder, hip, wrist and knee among students in Selangor

(Sabri et al., 2023). The study did not find that psychological distress is associated with neck pain but is associated with other physical pain. Other studies conducted among teachers in Malaysia showed that there is an increase in the trend of experiencing neck pain when the scores of self-reported questionnaires for depression and anxiety increase (Zamri et al., 2017).

The study concludes that teachers with high depression and anxiety are more prone to have neck pain. This study design did not draw any conclusions about the direction of the relationship between emotional distress and pain. People with chronic pain are significantly more likely to develop depression or anxiety (Gerrits et al., 2014). However, it is believed that psychological distress can contribute to the onset of acute neck pain, especially in adolescence, as this current study asks the respondents questions related to neck pain and psychological distress in the same time frame, which is in the past 7 days. Considering the high number of students suffering from depression, anxiety and stress, the counselling department needs to overcome these problems by conducting more programs to improve mental wellbeing. Students should be educated about psychological problems because they can cost a life. The promotion of good physical health also can be organised to achieve physical well-being. Neck pain is better treated during the acute stage before it becomes chronic. Prevention is better than cure.

## CONCLUSION

This study showed that 66.2% of the students suffered from mild to moderate disability of the neck. Depression, anxiety and stress affect quite a number of students, with 59.1%, 79.0% and 43.5%, respectively. Lastly, there was an association between neck pain and depression ( $p=0.006$ ), anxiety ( $p=0.023$ ), and stress ( $p=0.023$ ) among IUM Kuantan students.

## ACKNOWLEDGEMENT

This research would like to acknowledge the Department of Physical Rehabilitation Sciences, KAHS, for their utmost assistance.

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