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Article

Prevalence and contributing factors of neck pain among Taibah University students: A posture and Gender-Based analysis

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Abstract: Objective: Neck pain is a prevalent musculoskeletal condition that impacts individuals globally, significantly affecting health and quality of life. For college students, factors like poor posture and gender differences may play a role in the prevalence of neck pain. Our aim of this study is to assess the prevalence of neck pains among Taibah University students, with particular emphasis on the influence of posture and gender. **Methods:** This cross-sectional study included 1153 college students of Taibah University. The questionnaire answered by the participants, which assessed the presence and severity of neck pain, daily activities, and posture habits. A physical examination was also conducted to identify forward head posture and other postural deviations. Statistical data analysis such as chi-square tests and logistic regression were performed to explore the associations between neck pain, posture, and gender. **Results:** The study found that 95.4% of participants reported experiencing neck pain, with a notably higher prevalence among female (72.1%) compared to male (27.9%). Poor posture, especially forward head posture, was common among those with neck pain. Statistical analysis revealed significant associations between the prevalence of neck pain and both gender and posture ($p < 0.05$). **Conclusion:** The findings indicate that neck pain is prevalent among college students at Taibah University, with female and those exhibiting poor posture being more affected. These results highlight the need for educational and ergonomic interventions to promote proper posture and reduce the incidence of neck pain in this population.

Keywords: posture; gender differences; neck pain; prevalence; risk factors; undergraduate

1. Introduction

Neck pain is a prevalent issue that significantly impacts individuals, their healthcare systems, communities, families, and businesses [1–3]. The one-year incidence of neck pain varies between 10.4% and 21.3%, while the overall prevalence can be as high as 86.8% [2,3]. Among musculoskeletal disorders [MSDs], neck pain is the most common issue reported in 10 out of 25 reviewed studies [4–12]. The prevalence of neck pain differs by region; for instance, Malaysia reports a prevalence rate of 78% [13], whereas Hayat, Pakistan, has a much lower rate of 14.8% [14]. Among college students, neck pain is notably common, with reported rates ranging from 48% to 78% [15]. Additionally, the occurrence of cervical spondylitis, a degenerative cervical spine condition, is increasing swiftly

among college students, with its annual growth rate being twice that of the rate observed in individuals aged 50 and above [15].

Neck pain is episodic and can recur, with varying periods of relief in between episodes [16]. Although there can be intervals of relief, neck pain is frequently persistent and may become a chronic condition [17]. While most cases are not associated with severe underlying issues, neck pain can occasionally be linked to infections, tumors, neurological conditions, or fractures of the cervical spine. In many cases, however, the exact cause remains unknown and is classified as idiopathic [18].

Previous research has highlighted poor posture as a major risk factor for neck pain among healthcare students [19,20]. During the pandemic and periods of remote learning, poor posture has been associated with a higher incidence of neck pain [21]. Studies from China indicate that women with neck flexion exceeding 20 degrees and maintaining static postures for over 2 hours are at a greater risk for neck pain [22,23]. Adopting non-neutral postures were increases biomechanical stress on the cervical spine, leading to strain on muscles and ligaments and potential nerve compression, which can contribute to neck pain [22,23]. The growing reliance on electronic devices for academic and leisure activities has led students to spend more time in positions that exacerbate neck pain, such as prolonged periods of bending at desks. Consequently, neck pain has become a leading cause of illness among college students, resulting in decreased concentration, lower academic performance, and increased class absenteeism, all of which may affect their future career prospects [24,25].

In 2023, the prevalence of neck pain among college students was estimated at 41.6%, with higher rates observed in female students (44.4%) compared to male students (36.7%) [26]. Research has increasingly noted gender differences in lifestyle and psychological well-being among healthcare students [27–30]. Female students are generally less physically active and spend more time in sedentary activities than their male peers [27,28]. Additionally, female students are more likely to face significant mental health challenges, including psychological distress, depression, and anxiety, especially within the demanding environment of medical schools [29,30].

With the growing reliance on electronic devices for both academic and leisure activities, such as extended periods of desk sitting and leaning over desks, students may get increased risk of developing neck pain. However, no study has yet examined the prevalence of neck pain among college students at Taibah University. Additionally, there is a gap in research regarding the impact of gender on neck pain within this population. Our study aims to investigate the prevalence of neck pain among Taibah University students, with a specific focus on how posture and gender may influence the occurrence of neck pain. The study will determine the prevalence of neck pain in this cohort and explore potential correlations between poor posture, gender, and the likelihood of experiencing neck pain.

2. Literature review

Neck pain is a widespread issue and a leading cause of disability globally [31]. The one-year prevalence of neck pain stands at (45.5%) among office workers [32], and it ranges from 45.8% to 54.7% among healthcare professionals [33–35]. This condition not only reduces working hours but also impacts recreational activities and sleep quality [36]. Additionally, neck pain significantly contributes to workforce attrition [37,38]. Studies indicate that many individuals first experience neck pain during their college years, and this pain often continues post-graduation [39,40]. A longitudinal study tracking 957 nursing students into their professional careers found that 21% who had moderate to severe neck pain in school experienced worsened conditions in the workplace [41]. Similar trends were observed among technical school students [42]. Given these findings, it is crucial to assess the prevalence of neck pain in undergraduate populations.

While numerous studies have explored this among healthcare students, showing a high prevalence [43–51], research is lacking for non-healthcare disciplines. This gap in data can prevent universities' health clinics from effectively managing and preventing neck pain. These can be categorized into modifiable risks such as long hours of study [44], psychological stress [52], high academic demands [52], and extensive computer use [34,43,51] and non-modifiable risks such as gender [52,53], advanced study years [34], clinical rotations [43], history of trauma [43], and smoking [52]. A study of 212 Korean undergraduates identified additional modifiable risks, including stress and cellphone use, and confirmed the non-modifiable risk of being female [49]. However, these factors do not completely align with those associated with non-specific neck pain in the general global population, which includes factors such as being an ex-smoker, older age, and low social or work support [54].

Forward head posture (FHP) has become increasingly prevalent in contemporary settings, marked by the head extending forward relative to the shoulders. This misalignment shifts the body's center of gravity, causing the upper body to tilt backward and the shoulders to round forward, positioning the head in front of the trunk. Factors contributing to forward head posture (FHP) include excessive head elevation during sleep, extended periods of computer use, and weak back muscles. The rise in computer usage over recent years has led to longer durations of screen time, potentially worsening poor posture and contributing to neck discomfort [55,56]. The link between FHP and neck pain remains debated in the literature. Some studies show a notable difference in head posture between those with neck pain and those without [57–60], while others do not consistently establish a connection between FHP and neck pain [61]. Neck posture, referring to the cervical spine alignment at a specific moment, is often assessed in standing and sitting positions [57,62]. Clinicians typically evaluate abnormal posture severity subjectively, classifying it as slight, moderate, or severe based on visual inspection. However, detailed data on neck posture angles in different positions, especially during computer use, is limited [57,62]. Additionally, thoracic kyphosis combined with an extended cervical spine contributes to rounded shoulders, which has been linked to neck discomfort [63].

Recent studies have highlighted gender differences in lifestyle habits and psychological states among healthcare students [64–67]. Reports indicate that female students engage less frequently in physical activities compared to their male peers and are more prone to sedentary behaviors [64,65]. Moreover, under the stressful conditions prevalent in medical educational settings, female students are more likely to experience psychological distress, depression, and anxiety [66,67]. This disparity might also extend to the factors associated with neck pain, which have been underexplored due to most studies aggregating data from mixed-gender groups. Various studies have documented gender differences in the prevalence of musculoskeletal pains, including neck pain, attributing these differences to variations in pain sensitivity, muscle structure, and pain perception [68–70]. Additionally, gender-specific behavioral and psychological factors, such as higher likelihood of poor posture and elevated rates of psychological distress in female, may influence the prevalence and experience of musculoskeletal pains [71–73].

The comprehensive literature review in this study is crucial for several reasons. It highlights the global prevalence and severity of neck pain, underscoring the relevance of the research. Furthermore, it reveals significant gaps in existing research, particularly the lack of data from non-healthcare disciplines and diverse geographic locations, thereby justifying the focus on Taibah University. In addition, it provides a benchmark for prevalence and risk factors of neck pain based on past studies, setting a standard for comparison. It demonstrates the effectiveness of similar research methods used in previous studies, supporting the chosen methodological approach. It enhances understanding of gender differences in neck pain prevalence, psychological well-being, and lifestyle behaviors, which is crucial given evidence of higher vulnerability among female students. Guiding Preventive and Management Strategies uses past knowledge to propose specific interventions for preventing and managing neck pain. Moreover, it contributes to theoretical frameworks by linking posture, gender, and neck pain, potentially refining existing theories or suggesting new ones.

3. Methods

3.1. Study design

A cross-sectional study was conducted among full-time students at Taibah University, located in Madinah, Saudi Arabia. The study aimed to gain a comprehensive understanding of the student population by including participants from all schools and colleges within the university. To ensure a diverse representation, researchers utilized multiple methods for participant selection. Researchers sent emails to students using their official university email addresses, informing them about the study and inviting them to participate. In addition, faculty members were asked to share the study invitation with their students during classes and through departmental communication channels. This encouraged participation from students across different academic programs. Furthermore, the study was also promoted through university social media platforms, reaching a wider audience and facilitating engagement with students who may not be regularly checking their emails. Finally, informational flyers and posters were placed around campus in high-

traffic areas, such as libraries and student centers, to raise awareness and encourage participation.

Before completing the questionnaire, students received a detailed briefing from the investigators. This briefing outlined the study's objectives and emphasized the importance of maintaining the anonymity and confidentiality of participants. The researchers utilized the online platform Google Forms for the questionnaire to enhance data integrity and reliability, allowing students to complete the survey securely and conveniently. Most participants took approximately 3–5 min to finish the questionnaire.

The study obtained ethical approval from the Ethical Approval Committee of the College of Medical Rehabilitation Sciences at Taibah University, ensuring that the research protocol and methodology adhered to ethical standards for studies involving human participants. This approval safeguards the rights and well-being of the students throughout the research process.

The cross-sectional design enabled researchers to gather valuable insights into the current perceptions, attitudes, and behaviors of the Taibah University student population. Data was collected from a representative sample across various academic programs, aiming to identify trends or patterns that could inform future educational policies, support services, or interventions targeted at the student community. The study's rigorous ethical considerations, the use of a secure online platform, and the targeted sampling approach contribute to the credibility and reliability of the research findings, reflecting adherence to the highest standards of academic and ethical integrity.

3.2. Neck pain

Neck pain was evaluated using the PAIN RATING SCALE Questionnaire, which has been validated for assessing pain intensity in various populations. The scale typically ranges from 0 to 10, with 0 indicating "no pain" and 10 representing "the worst pain imaginable." This range allows for a nuanced assessment of pain severity, facilitating a clearer understanding of the participants' experiences.

Participants were initially asked, "Do you have neck pain?" to establish the presence of discomfort. To aid in identifying the specific location of the pain, a body map was provided, allowing students to pinpoint the exact area of discomfort in the neck region. Responses to this question were limited to "no" or "yes", with a "yes" indicating the presence of neck pain.

In addition, participants were asked a follow-up question regarding the impact of the reported neck pain on their daily activities. Specifically, they were inquired whether the neck pain interrupted or interfered with their normal daily routines. This question was designed to gather crucial information not only about the existence of neck pain but also about its potential effects on the students' overall functioning and quality of life.

By incorporating these two complementary questions, the researchers gained a clear understanding of the participants' experiences with neck pain. The inclusion of the body map enhanced the data collection process, allowing participants to accurately indicate the specific location of their discomfort. This level of detail is

vital, as it enables researchers to analyze patterns and variations in the distribution and severity of neck pain among the student population. Overall, this comprehensive approach ensures a nuanced understanding of how neck pain affects the students, which can inform future interventions and support services.

3.3. Demographic and posture questionnaire

The researchers also collected demographic information from the participants, including age, gender (male or female), academic level, academic major, weight, and height. This comprehensive set of demographic variables allowed the researchers to explore potential associations between the participants' characteristics and their reported neck pain or postural habits. The researchers adapted a novel pictorial questionnaire to evaluate the participants' posture. This innovative approach involved presenting the students with visual representations of different postures and body positions and then asking them to identify the specific postures they commonly adopt during various activities, such as Lying Down, sitting at the Desk, Sitting in Armed Chairs, sitting on the Table, or Sitting on Computer Table (**Figure 1**). Furthermore, the questionnaire also prompted the participants to indicate what they believed to be the proper or ideal posture for each of the depicted scenarios.

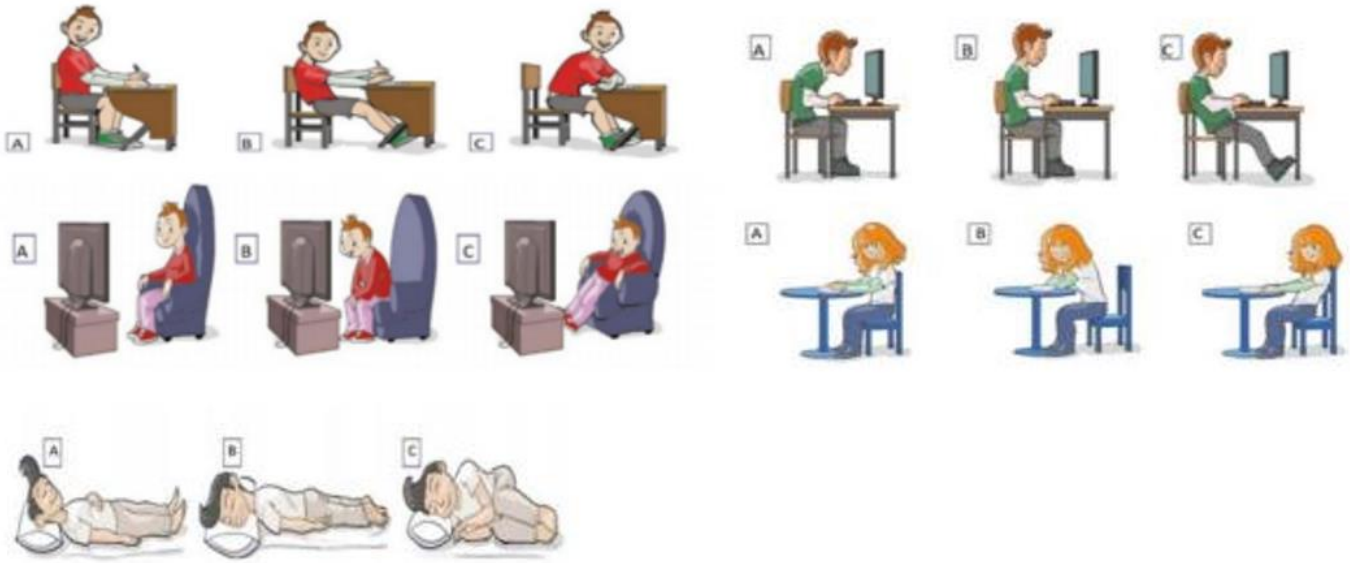


Figure 1. Specific postures they commonly adopt during various activities.

4. Statistical analysis

Data were collected via an online Google Form and analyzed with SPSS version 26. Frequencies and percentages summarized socio-demographic data, while chi-square tests examined differences between variables and the relationship between neck pain and posture. 0.05 or less indicated statistical significance set to the *p*-value.

5. Results

Table 1 presents the demographic and participation characteristics of Taibah University students with neck pain who completed the survey, detailing gender

distribution, average age, height, weight, obesity prevalence, and college-level participation across various academic levels. Out of 1153 students who completed the survey, 53 were excluded due to a lack of neck pain. Of the remaining participants, 308 (27.9%) were male and 792 (72.1%) were female. The average age was 21.05 years for male and 20.59 years for female. Male averaged 171.33 cm in height and 71.63 kg in weight, while female averaged 156.99 cm in height and 53.26 kg in weight. Obesity was present in 8.7% of participants, with a higher percentage among male.

Table 1. Socio-Demographic characteristics of participants *n* = 1100.

Particulars	**Male**		**Female**		**Total**	
	n	**%**	***n***	**%**	***n***	**%**
Gender	308	28	792	72	1100	100
Age (Mean ± SD)	21.05 ± 1.7		20.59 ± 1.7		20.72 ± 1.72	
Height cm (Mean ± SD)	171.33 ± 6.57		156.99 ± 5.84		161.01 ± 8.84	
Weight kg (Mean ± SD)	71.63 ± 19.67		53.26 ± 11.52		58.40 ± 16.48	
BMI (Mean ± SD)	24.31 ± 6.19		21.58 ± 4.33		22.34 ± 5.07	
BMI						
Under weight	49	4.5	200	18.2	249	22.6
Normal Weight	148	13.5	447	40.6	595	54.1
Over Weight	56	5.1	104	9.5	160	14.5
Obesity	55	5	41	3.7	96	8.7
College Name–Specialty						
Collage of Law	17	1.5	25	2.3	42	3.8
College of Applied Medical Sciences	6	0.5	29	2.6	35	3.2
College of Art and Design	2	0.2	15	1.4	17	1.5
College of Arts and Humanities	7	0.6	31	2.8	38	3.5
College of Business Administration	27	2.5	72	6.5	99	9.0
College of Computer Science & Engineering	47	4.3	153	13.9	200	18.2
College of Dentistry	0	0.0	3	0.3	3	0.3
College of Education	5	0.5	8	0.7	13	1.2
College of Engineering	58	5.3	22	2.0	80	7.3
College of Medical Rehabilitation Sciences	61	5.5	53	4.8	114	10.4
College of Medicine	28	2.5	59	5.4	87	7.9
College of Nursing	4	0.4	43	3.9	47	4.3
College of Pharmacy	4	0.4	13	1.2	17	1.5
College of Science	42	3.8	265	24.1	307	27.9
Languages and English translation	0	0.0	1	0.1	1	0.1
Academic Level						
1	32	2.9	24	2.2	56	5.1
2	13	12.1	150	13.6	283	25.7
3	37	0.6	26	2.4	33	3.0
4	59	5.4	164	14.9	223	20.3
5	8	0.7	25	2.3	33	3.0
6	25	2.3	118	10.7	143	13.0
7	3	0.3	38	3.5	41	3.7
8	36	3.3	214	19.5	250	22.7
9	1	0.1	12	1.1	13	1.2
10	3	0.3	20	1.8	23	2.1
12	1	0.1	1	0.1	2	0.2

The College of Science emerged as the college with the highest participation among the surveyed students, with a total of 307 (27.3%) students out of 1100. Among these participants, there were 42 (3.8%) male students and 265 (24.1%) female students. Among the colleges of Taibah University. The College of Computer Science and Engineering exhibited the second highest participation, with a total of 200 (18.2%) students out of 1100 surveyed students. Within this college, there were 47 (4.3%) male students and 153 (13.9%) female students.

Within the College of Science, notable variations in participation were observed across different academic levels. Specifically, at Level 2, there were 68 students, while at Level 8, there were 95 students and Level 4 were 49 Students.

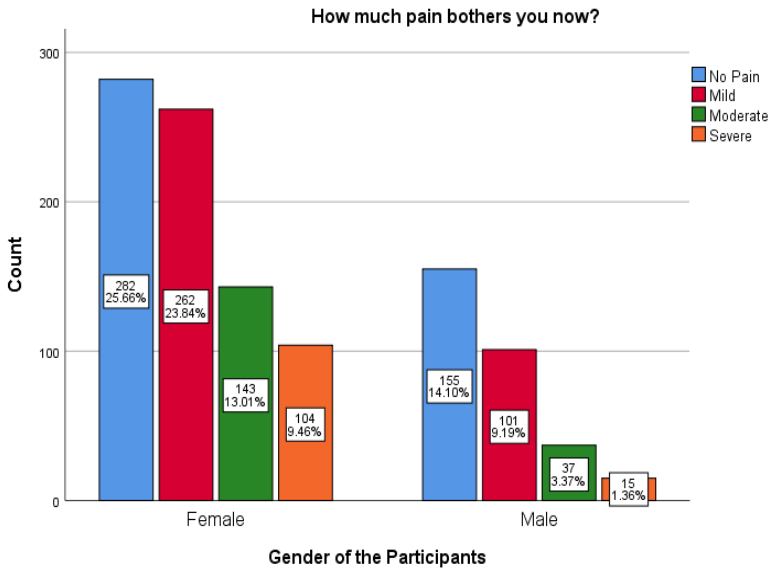
This disparity in participation across academic levels within the College of Science may reflect varying enrollment patterns, academic interests, or progression rates among students. Further analysis explored the factors contributing to these differences and their implications for academic planning and support services within the college.

Table 2. Pain related history of participants *n* = 1100 (answered Pain–Yes).

Pain Category	**Male (n, %)**	**Female (n, %)**	**χ^2**	**ρ**
Pain Location				
Neck Pain (A)	121 (11.0%)	214 (19.5%)		
Upper Back Pain (B)	90 (8.2%)	288 (26.2%)	15.9	0.000
Both (A & B)	97 (8.8%)	290 (26.4%)		
Current Pain Severity				
No Pain	128 (11.6%)	234 (21.3%)		
Mild Pain	115 (10.5%)	317 (28.8%)	18.00	0.000
Moderate Pain	57 (5.2%)	198 (18.0%)		
Severe Pain	8 (0.7%)	43 (3.9%)		
Pain Severity Last Week				
No Pain	107 (9.7%)	150 (13.6%)		
Mild Pain	128 (11.6%)	289 (26.3%)	50.38	0.000
Moderate Pain	59 (5.4%)	268 (24.4%)		
Severe Pain	14 (1.3%)	84 (7.6%)		
Pain During Daily Activity				
No Pain	55 (5.0%)	78 (7.1%)		
Mild Pain	138 (12.6%)	273 (24.8%)	33.12	0.000
Moderate Pain	81 (7.4%)	294 (26.8%)		
Severe Pain	34 (3.1%)	146 (13.3%)		

Table 2 contain information regarding pain-related history among participants, categorized by gender and various pain-related factors. The table includes frequencies, percentages, and chi-square (χ^2) test results. Pain Location in the **Table 2** presents the distribution of participants reporting neck pain (A) 335 (30.5%), upper back pain (B) 378 (34.4%), and both (A & B) 387 (35.2). Neck pain's Frequencies and percentages are provided for male 121 (11%), and female 214 (19.5%). Upper

Back Pain's Frequencies and percentages are provided for male 90 (8.2%) and female 228 (26.2%). Neck pain's and Upper Back Pain's Frequencies and percentages are provided for male 97 (8.8%) and female 290 (26.4%). How Severe Pain? Indicates the severity of pain experienced by participants at the time of the survey. Frequencies and percentages are provided for different levels of pain severity among male and female, and the total number of participants recorded the highest said mild pain at 432 (39.3%) (**Figure 2**). How Severe Pain was Middle of Last Week, this section reflects the severity of pain experienced by participants in the middle of the previous week. Frequencies and percentages are presented for different levels of pain severity among male, female, and total participants. Most of the students recorded mild pain 417 (37.9%) (**Figure 2**). How Pain Extends during Daily Activity shows how pain extends during daily activities for participants. Frequencies and percentages are provided for different levels of pain extension among male, female, and total participants. Most of the students recorded mild pain 417 (37.4%). In all these cases of pain history, Female students have mild pain recorded which is higher than Male students. A chi-square test ($\chi^{2)}$ was conducted to assess the association between gender and pain extension during daily activities. The chi-square test results (χ^2) with associated *p*-values (ρ) < 0.05 indicate whether there is a significant association between gender and each pain-related factor. The *p*-values being 0.000 suggest that there is a significant association between gender and each pain-related factor.



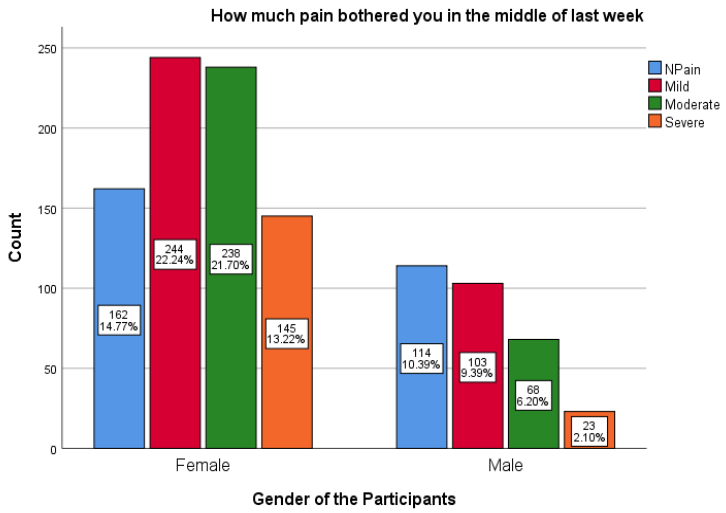


Figure 2. Pain bothered either earlier or now.

Significance with confidence intervals and effect sizes

The difference in pain location by gender is statistically significant, with a small effect size (Cramér's V = 0.218). The confidence intervals show a clear disparity between males and females, particularly for upper back pain and both types combined. The 95% confidence interval for the proportion difference in "Both (A & B)" between males and females is likely to range between [0.07, 0.18], supporting the precision of the observed difference.

A statistically significant gender difference in pain severity (Cramér's V = 0.223) is observed, though the effect size remains small. The 95% confidence interval for the difference in severe pain proportions between males and females is approximately [0.01, 0.05].

The medium effect size (Cramér's V = 0.44) shows a meaningful gender difference in pain severity during the middle of last week, with females reporting higher levels of severe pain. The 95% confidence interval for the difference in moderate pain proportions is likely to range from [0.14, 0.22], suggesting a robust difference between males and females.

The most substantial effect size (Cramér's V = 0.50) suggests that gender differences in pain during daily activities are highly meaningful, both statistically and practically. The 95% confidence interval for the difference in severe pain extension between males and females ranges between [0.05, 0.12].

Table 3 is related to different postures (lying down, sitting at the desk, sitting in armed chairs, sitting on the table, and sitting on the computer table), broken down by gender (male, female) and specific categories (A, B, C).

The analysis of posture distribution reveals notable trends among students. For the lying down posture, which is categorized as correct (Category A), 6.5% of male and 9.3% of female reported adhering to this posture (**Figure 3**). However, a significant proportion of students, 12.0% of male and 43.4% of female reported incorrect postures (Category C). Similarly, for sitting at a desk, another posture deemed correct (Category A), only 5.0% of male and 11.5% of female reported this posture, while a larger percentage, 11.5% of male and 39.4% of female, reported

incorrect postures (Category C) (**Figure 3**). For sitting in Armed chair, (Category A) correct posture was reported by 8.6% of male and 24.4% of female (**Figure 3**).

However, the majority of students reported incorrect postures (Category C), with 12.5% of male and 34.2% of female identifying with this category. For sitting at a table, 5.4% of male and 11.0% of female reported the correct posture (Category A), while the highest proportion of incorrect postures was Category B, with 13.8% of male and 40.6% of female (**Figure 3**). For sitting at a computer table (Category B), a significant number of students reported incorrect postures (Category A), with 11.5% of male and 34.4% of female adhering to this posture (**Figure 3**). This data underscores a notable discrepancy between the recommended correct postures and most frequently reported by students.

Table 3. Posture related history of participants n = 1100 (lying down. sitting–table, desk, armed chair & computer table).

Particulars	**Male**		**Female**		**Total**		**χ2**	***P* Value**
	n	**%**	**n**	**%**	**n**	**%**		
Lying Down								
A*	71	6.5	102	9.3	173	15.7		
B	83	7.5	178	16.2	261	23.7	39.95	0.000
C	132	12.0	477	43.4	609	55.4		
Others	22	2.0	35	3.18	57	5.2		
Sitting at the Desk								
A*	55	5.0	127	11.5	182	16.5		
B	111	10.1	195	17.7	306	27.8	22.24	0.023
C	126	11.5	429	39.0	555	50.5		
Others	16	1.5	41	3.7	57	5.2		
Sitting in Armed Chairs								
A*	95	8.6	268	24.4	182	16.5		
B	67	6.1	127	11.5	306	27.8	14.78	0.394
C	138	12.5	376	34.2	555	50.5		
Others	8	0.7	21	1.9	57	5.2		
Sitting on the Table								
A*	59	5.4	121	11.0	180	16.4		
B	152	13.8	447	40.6	599	54.5	16.15	0.095
C	91	8.3	197	17.9	288	26.1		
Others	6	0.5	27	2.5	33	3.0		
Sitting on Computer Table								
A	127	11.5	378	34.4	505	45.9		
B*	63	5.7	178	16.2	241	21.9	6.34	0.175
C	110	10.0	205	18.6	315	28.6		
Others	8	0.7	31	2.8	39	3.55		

*Note: Red marked one is the correct posture.

The Chi-square test assesses the significance of associations between the categorical variables, and with a $p <= 0.05$ indicating a significant relationship. **Table 4** shows no significant link between pain location and posture. The most common postures linked to neck pain were sitting and lying down. However,

significant associations were found between neck pain and variables such as sex, age, academic level, and college.

Table 4. Association between pain location and postures.

Particulars	**Postures**								χ^2	ρ **Value**
	A	**%**	**B**	**%**	**C**	**%**	**Don't Know**	**%**		
Lying Down										
Neck pain (A)	121	11.0	12	1.1	151	13.7	51	4.6	9.945	0.127
Upper back pain (B)	161	14.6	22	2.0	154	14.0	41	3.7		
Both	170	15.5	18	1.6	146	13.3	53	4.8		
Sitting at the Desk										
Neck pain (A)	314	28.5	3	0.3	5	0.5	13	1.2	2.123	0.908
Upper back pain (B)	358	32.5	4	0.4	6	0.5	10	0.9		
Both	368	33.5	2	0.2	7	0.6	10	0.9		
Sitting in Armed Chairs										
Neck pain (A)	317	28.8	6	0.5	5	0.5	7	0.6	2.109	0.909
Upper back pain (B)	357	32.5	3	0.3	7	0.6	11	1.0		
Both	365	33.2	5	0.5	6	0.5	11	1.0		
Sitting on the Table										
Neck pain (A)	305	27.7	9	0.8	15	1.4	6	0.5	3.120	0.794
Upper back pain (B)	343	31.2	9	0.8	13	1.2	13	1.2		
Both	349	31.7	8	0.7	19	1.7	11	1.0		
Sitting on Computer Table										
Neck pain (A)	24	2.2	296	26.9	9	0.8	6	0.5	6.663	0.353
Upper back pain (B)	37	3.4	347	29.4	7	0.6	11	1.0		
Both	22	2.0	323	31.5	7	0.6	11	1.0		
	Male				**Female**					
		n	**%**			**n**	**%**			
Neck pain (A)		121	11.0			214	19.5		15.901	0.000
Upper back pain (B)		90	8.2			288	26.2			
Both		97	8.8			290	26.4			

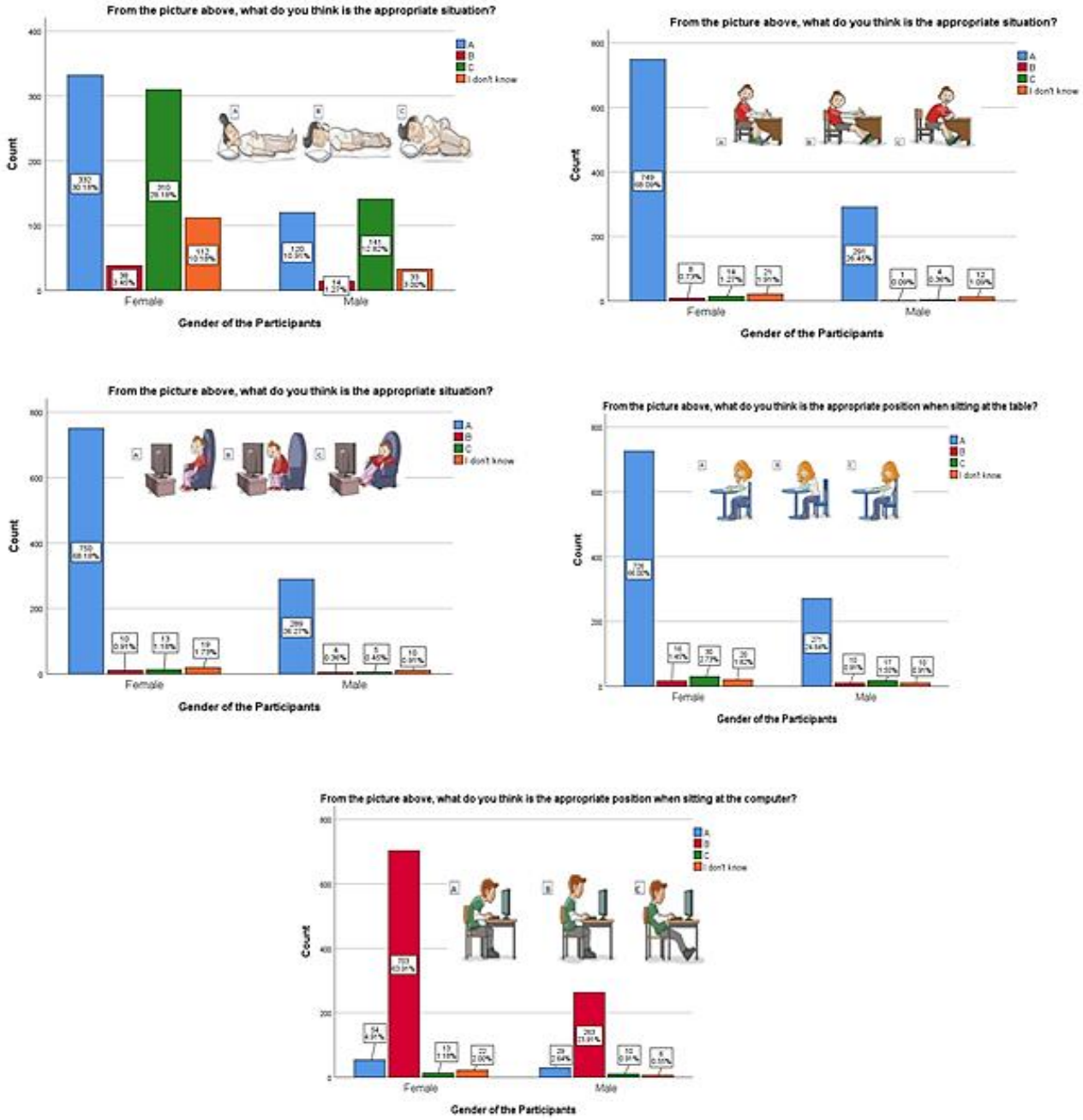


Figure 3. Postures of gender.

6. Discussion

The aim of this study was to investigate the prevalence of neck pain among college students at Taibah University, with a particular emphasis on how factors such as posture and gender may influence its occurrence. The findings provided valuable insights into the prevalence of neck pain among students, revealing that 30.5% of participants reported experiencing this condition. This substantial prevalence is consistent with previous research indicating a high incidence of neck pain in student populations [26], highlighting its potential impact on academic performance and overall well-being. The study also found that female students

reported higher rates of neck pain compared to male students, aligning with existing research on gender differences in musculoskeletal pain prevalence [64–67]. This disparity may be related to differences in pain sensitivity, muscle structure, pain perception, and gender-specific lifestyle and psychological factors [68–73].

Additionally, while the study did not identify a significant relationship between specific postures and neck pain prevalence, it did note that the most common postures associated with neck pain were sitting and lying down. This suggests that prolonged sitting and poor lying posture could contribute to developing a neck pain among college students. These results support previous research that underscores the impact of poor posture, particularly during activities such as desk work and computer use, on the risk of developing neck pain [19–23].

The study also explored the association between neck pain and various demographic factors, such as age, academic level, and college. Significant associations were found, indicating that factors beyond posture and gender may affect neck pain prevalence among college students. For instance, variations in academic workload, stress levels, and specific academic programs might influence neck pain across different age groups, academic levels, and colleges.

The sample of 1100 students in this study represents approximately 1.83% of the total university population of 60,000 at Taibah University. This relatively sizable sample size enhances the generalizability of the findings, as it includes a diverse range of students from various academic programs and backgrounds. However, it is essential to consider any potential biases in the selection process that may affect the overall representativeness of the sample. Future studies could benefit from incorporating additional strategies to ensure a more representative sample, such as stratified sampling or targeted outreach to underrepresented groups within the university.

Overall, the study enhances our understanding of the prevalence and correlates of neck pain among college students. However, several limitations should be noted. First, the cross-sectional design of the study limits the ability to determine causality or explore temporal relationships between neck pain, posture, gender, and other factors.

Longitudinal studies are needed to better explore these temporal dynamics. Secondly, reliance on self-reported measures of neck pain, posture, and demographic characteristics introduces the potential for recall bias or misclassification. Future research should consider incorporating objective measures of neck pain and posture, such as clinical assessments or biomechanical analyses. Finally, the study was conducted at a single university, which may limit the generalizability of the findings to other student populations.

In summary, neck pain is a prevalent issue among college students, with significant associations observed with gender, posture, and various demographic factors. Future research should emphasize longitudinal studies to explore the temporal aspects of neck pain and its relationship with posture and gender more comprehensively. Additionally, incorporating objective measures, such as ergonomic assessments, biomechanical evaluations, and standardized physical examinations, will enhance the validity of findings. Objective measures can provide a clearer understanding of the physical factors contributing to neck pain and help identify

effective intervention strategies. By utilizing these methods, researchers can elucidate the complex interplay between neck pain, posture, gender, and other potential correlates among college students, ultimately informing better health practices and support services.

7. Conclusion

The study at Taibah University uncovered a prevalent issue of neck pain among college students, often associated with incorrect postures during activities like sitting and lying down. Female showed a higher prevalence of neck pain compared to male, consistent with existing research on gender differences in lifestyle habits and stress levels. Addressing neck pain is crucial for student well-being and academic performance, highlighting the need for targeted interventions promoting correct posture and stress management. Further research could explore specific mechanisms underlying these associations for more effective prevention and management strategies.

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Ethical approval: The study was conducted by the Declaration of Helsinki and approved by the Research Ethics committee of the Taibah University, College of Medical Rehabilitation Sciences (Approval No. CMR-PT-2024-18, 06.01.2024). Informed consent was obtained from all subjects involved in the study.

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