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CERVICOGENIC HEADACHE IN UNDERGRADUATE STUDENTS AND ITS ASSOCIATION WITH FORWARD HEAD POSTURE, ACADEMIC STRESS, AND ANXIETY IN QUETTA, PAKISTAN

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Abstract

Background: *Cervicogenic headache (CGH) is a secondary headache associated with dysfunction of cervical structures. Forward head posture (FHP), prolonged digital-device use, and psychological stress may be relevant factors among university students, but their relationships are complex. Objective: To describe the occurrence and severity of cervicogenic-headache symptoms among undergraduate students in Quetta and examine their associations with FHP, stress, and anxiety.*

Methods: *A quantitative cross-sectional study was conducted among undergraduate students aged 18–30 years from three universities in Quetta. Convenience sampling was used. Data were collected using the Cervicogenic Headache Patient Questionnaire (CHPQ), the Depression Anxiety Stress Scales–21 (DASS-21), and a mobile posture-assessment application to estimate the craniovertebral angle (CVA). Data were analysed in SPSS using descriptive statistics, correlation analyses, and chi-square testing.*

Results: *The thesis records included 151 participants, while some analyses had 150 valid responses. CHPQ severity was mild in 47.7%, moderate in 14.6%, and severe in 37.1% of valid responses. Approximately 62% had abnormal FHP screening results. Pearson correlation between CHPQ severity and FHP was not significant ($r = -0.044$, $p = 0.595$). The association between CHPQ and stress/anxiety was weak; Pearson's r was 0.156 ($p = 0.057$), while Spearman's rho was 0.163 ($p = 0.046$). The chi-square association was borderline and not statistically significant at the 0.05 level ($\chi^2 = 15.052$, $df = 8$, $p = 0.058$).*

Conclusion: *Headache symptoms and postural abnormalities were common in this sample, but the analyses did not demonstrate a significant relationship between FHP and CHPQ severity. The association between stress/anxiety and headache severity was weak and differed slightly according to the statistical test. Findings should be interpreted cautiously because of the cross-sectional design, convenience sampling, and inconsistencies in valid sample counts.*

Introduction

Cervicogenic headache (CGH) is a secondary headache in which pain is referred to the head from structures of the cervical spine and surrounding soft tissues. Symptoms may be associated with neck movement, sustained positions, restricted cervical mobility, or musculoskeletal dysfunction. In university students, long periods of studying and using phones or computers may encourage sustained neck flexion and forward head posture (FHP), potentially increasing cervical loading and discomfort.

FHP describes a posture in which the head is positioned anterior to the trunk. It is commonly screened by measuring the craniovertebral angle (CVA) from a side-profile photograph; a smaller angle is generally interpreted as greater forward head displacement. Although postural alignment may be relevant to cervical symptoms, posture alone does not explain every headache presentation, and the relationship between posture and pain varies across individuals and study settings.

Academic demands can also contribute to psychological strain. Stress and anxiety may influence pain perception, muscle tension, sleep, coping, and daily functioning. Headache symptoms in students may therefore reflect a combination of physical, behavioural, and psychological factors rather than a single cause. Previous research has examined headache symptoms, device use, cervical posture, and student stress, but fewer studies have examined these factors together in university students in Quetta.

This study aimed to describe the occurrence and severity of cervicogenic-headache symptoms among undergraduate students in Quetta and examine the relationships of CHPQ severity with FHP, stress, and anxiety.

Materials and Methods

A quantitative cross-sectional study was conducted among undergraduate students aged 18–30 years from three universities in Quetta, Balochistan, Pakistan, using a convenience sampling technique. The thesis describes a target sample of 150 students, although some statistical output tables contain 151 records and several analyses include 150 valid responses. Eligible participants were currently enrolled full-time students who reported headache or neck-related symptoms during the preceding three months, demonstrated forward head posture (FHP) on craniovertebral angle (CVA) screening, and were able to provide informed consent. The exclusion criteria stated in the thesis included ongoing physiotherapy or postural treatment and psychiatric conditions beyond mild or moderate anxiety. Data were collected using the Cervicogenic Headache Patient Questionnaire (CHPQ) to assess headache-related symptoms and severity, the Depression Anxiety Stress Scales–21 (DASS-21) to evaluate depression, anxiety, and stress, and a mobile posture-assessment application to estimate the CVA from side-profile images, with a reduced angle indicating forward head posture. The collected data were entered and analysed using the Statistical Package for the Social Sciences (SPSS). Descriptive statistics, including frequencies and percentages, were used to summarise participant characteristics and study variables, while Pearson's correlation, Spearman's rank correlation, and chi-square tests were used to examine relationships between CHPQ severity, FHP, stress, and anxiety. A p-value of less than 0.05 was considered statistically significant. The thesis states that the required approvals and informed consent were obtained and that participant confidentiality was maintained.

Results

The available thesis output includes 151 records in some descriptive tables and 150 valid responses for several outcome measures. Percentages below are reproduced from the thesis presentation and may not sum to 100% because of rounding or missing responses.

Table 1. Participant characteristics (n = 150/151 as recorded)

Variable	Category	Frequency / value
Age	Mean age	21.96 ± 1.70 years
Age	Range	18–27 years

Gender	Male	58.0%
Gender	Female	42.0%
Year of study	1st year	26.7%
Year of study	2nd year	18.0%
Year of study	3rd year	24.7%
Year of study	4th year	24.7%
Year of study	Final year	6.0%

Note: The thesis has inconsistent sample totals across output tables. Confirm exact counts and denominators from the final SPSS dataset.

Table 2. Average daily digital-device use

Daily use	Percentage
Less than 2 hours	12.0%
2–4 hours	24.7%
4–6 hours	33.3%
More than 6 hours	30.0%

Note: Percentages are transcribed from the thesis presentation.

Table 3. Relevant self-reported health history

Health-history category	Percentage
No reported issue	36.0%
Anxiety/stress	24.7%
Poor posture	18.0%
Eye strain	12.7%
Previous neck injury	8.7%

Note: Categories and percentages are reproduced as reported; check whether categories were mutually exclusive.

Table 4. Self-reported diagnosis of cervicogenic headache

Response	Frequency / percentage
Yes	37 (24.7%)
No	67 (44.7%)
Unsure	46 (30.7%)

Note: The source reports 150 valid responses and one missing response in the corresponding table.

Table 5. CHPQ headache/pain severity

Severity category	Frequency	Percentage
Mild	72	47.7%
Moderate	22	14.6%
Severe	56	37.1%
Valid total	150	99.3% of full 151 records

Note: One response was missing. Percentages are those shown in the thesis; small discrepancies reflect rounding/denominator conventions.

Table 6. Forward head posture screening by craniovertebral angle

CVA screening category	Frequency / percentage
Abnormal FHP	93 (62.0%)
Normal posture screening	57 (38.0%)

Note: The thesis presentation reports 93 abnormal and 57 normal results. Verify the precise CVA cut-off and denominator in the methods and dataset.

Table 7. Correlation and association tests

Variables compared	Statistical test	Result	Interpretation
CHPQ severity and FHP	Pearson correlation	$r = -0.044$; $p = 0.595$	Not statistically significant
CHPQ severity and stress/anxiety	Pearson correlation	$r = 0.156$; $p = 0.057$	Weak positive association; not significant at $p < 0.05$
CHPQ severity and stress/anxiety	Spearman correlation	$\rho = 0.163$; $p = 0.046$	Weak positive association; statistically significant but small
CHPQ severity and stress/anxiety categories	Chi-square	$\chi^2 = 15.052$; $df = 8$; $p = 0.058$	Borderline; not statistically significant at $p < 0.05$
FHP and stress/anxiety	Pearson correlation	$r = -0.008$; $p = 0.925$	No significant association
FHP and stress/anxiety categories	Chi-square	$p = 0.772$	No significant association

Note: These results are reproduced from the thesis output. The different significance results for Pearson, Spearman, and chi-square should be reported transparently, not selectively.

The descriptive findings indicate that a substantial proportion of participants reported moderate or severe headache symptoms, and nearly two-thirds screened positive for FHP. Digital-device use was prolonged for many participants: 63.3% reported at least four hours per day. However, correlation analysis did not identify a statistically significant relationship between CHPQ severity and FHP. The relationship between CHPQ severity and stress/anxiety was weak, with significance depending on the statistical test used.

Discussion

This study examined cervicogenic-headache symptoms and their relationships with forward head posture, stress, and anxiety among undergraduate students in Quetta. More than one-third of valid respondents were classified in the severe CHPQ category, while nearly half were classified as mild and a smaller proportion as moderate. The proportion reporting a prior diagnosis was lower than the proportion classified as having symptoms across CHPQ severity categories. This difference may reflect limited previous diagnosis, uncertainty about headache type, or the fact that a questionnaire-based symptom classification is not equivalent to a clinical diagnosis.

FHP was identified in approximately 62% of the sample. This finding is relevant in a student population where many participants reported several hours of daily digital-device use. Prolonged screen use and sustained neck positions may contribute to cervical discomfort; however, the present study did not demonstrate a statistically significant correlation between FHP and CHPQ severity ($r = -0.044$, $p = 0.595$). Therefore, the data do not support concluding that FHP alone was associated with greater headache severity in this sample. Headache symptoms may be influenced by other physical, behavioural, and psychological factors, and cross-sectional data cannot establish cause and effect.

The association between stress/anxiety and CHPQ severity was weak. Pearson correlation was not statistically significant ($r = 0.156$, $p = 0.057$), whereas Spearman correlation showed a small positive association ($\rho = 0.163$, $p = 0.046$). The chi-square result was close to, but above, the conventional significance threshold ($\chi^2 = 15.052$, $df = 8$, $p = 0.058$). These differences may relate to how variables were coded and which statistical assumptions each test uses. The findings should therefore be described as a weak and inconsistent

association rather than strong evidence that stress or anxiety predicts headache severity.

The absence of a significant association between FHP and stress/anxiety (Pearson r = −0.008, p = 0.925; chi-square p = 0.772) also suggests that the measured psychological variables and posture screening did not show a clear linear or categorical relationship in this dataset. This does not rule out meaningful relationships in other populations; it indicates only that the present analyses did not detect them.

Taken together, the results support a biopsychosocial perspective on student headaches while underlining the need for careful interpretation. Universities may consider posture and ergonomic education, regular movement breaks, appropriate workstation setup, and access to stress-management support. Students with persistent or severe headaches should receive clinical assessment to confirm the headache type and rule out other causes.

Limitations

The cross-sectional design prevents causal conclusions. Convenience sampling from three universities in one city limits generalisability. Several variables were self-reported, and posture was assessed using a mobile application rather than a full clinical biomechanical assessment. Some tables contain 151 records while outcome analyses report 150 valid responses, and the source output includes small discrepancies in percentages and p-values across tests. The thesis should be checked against the original SPSS output to verify denominators, coding, missing data, and the exact CVA cut-off before publication. The results should not be interpreted as a clinical diagnosis of CGH for every participant classified by questionnaire.

Conclusion

Cervicogenic-headache symptoms and forward head posture screening abnormalities were common among the undergraduate students assessed in Quetta. CHPQ severity was not significantly correlated with FHP. Stress/anxiety showed a weak relationship with headache severity, but statistical significance varied by test, and categorical analysis was borderline. These findings suggest that headache symptoms in students are multifactorial and that posture and psychological factors should be evaluated without assuming a direct causal relationship.

Recommendations

Future studies should recruit larger, more representative samples and verify sample size and missing-data handling before analysis. Longitudinal research may help clarify the temporal relationships between posture, psychological distress, device use, and headache symptoms. Future work should consider objective or clinically validated posture assessment, clinical confirmation of CGH, and additional factors such as sleep, physical activity, ergonomics, and neck function. Universities may promote ergonomic awareness, movement breaks, posture education, and accessible student mental-health support.

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