

Prevalence, Disability, and Psychosocial Correlates of Headache Disorders Among Palestinian School-Aged Adolescents: A Cross-Sectional Study

Malek N. Itmaiza

malik.itmaiza@students.alquds.edu

Al-Quds University

Alhareth Amro

Al-Quds University

Yagenaldeen Y. Aljawabreh

Al-Quds University

Osama J. Makhamreh

Al-Quds University

Mohammad W. Awlad Mohammad

Al-Quds University

Ismail Abudaya

Hebron governmental Hospital

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Abstract

Background: Headache disorders are common during adolescence and may substantially affect school performance, daily functioning, sleep, and psychological well-being. However, school-based data on headache burden among Palestinian adolescents remain limited. This study aimed to assess the prevalence, clinical patterns, headache-related disability, and associated factors in Palestinian school-aged adolescents.

Methods: A school-based cross-sectional study was conducted among Palestinian students aged 15–19 years in the West Bank. Data were collected using a structured, self-administered questionnaire. Headache diagnoses were classified using symptom-based criteria from the International Classification of Headache Disorders, 3rd edition. Headache-related disability was assessed with the Pediatric Migraine Disability Assessment Scale PedMIDAS. Psychological symptoms, sleep disturbance, and perceived stress were evaluated using standardized screening scales. Descriptive analyses and multivariable regression models were performed.

Results: Among 535 students, most students reported non-specific headache 220 (41.2%), followed by tension-type headache TTH 124 (23.2%), migraine without aura 64 (12.0%), migraine with aura 35 (6.5%), and cluster headache 4 (0.7%), only 87 students (16.3%) reported no headache. According to PedMIDAS, 62 (11.6%) had severe disabilities. Severe depression was associated with migraine without aura (OR= 7.9, 95%CI: 1.8 to 35.6, $P= 0.007$), non-specific headache (OR= 4.0, 95%CI: 1.2 to 13.5, $P= 0.0248$), TTH (OR= 11.3, 95%CI: 3.1 to 40.7, $p= 0.0002$). Severe anxiety was associated with migraine with aura (OR= 14.8, 95%CI: 1.6 to 136.2, $P= 0.017$). Those reporting more than 5 headache days per month had markedly higher odds of greater disability (OR= 15.2, 95%CI: 7.1 to 33.9, $P< 0.001$).

Conclusion: Headache disorders were highly prevalent among Palestinian adolescents and were associated with meaningful functional, psychological, and educational burden. Headache frequency and severe depression were key correlates of headache-related disability. These findings support the need for integrated school-based strategies addressing headache recognition, mental health, and timely medical care.

Highlights

- high prevalence of headache observed having more than four-fifths of the sample were classified as having some form of headache.
- Non-specific headache was the most frequently identified category, followed by tension-type headache TTH and migraine.
- Severe depression was consistently associated with several headache categories and with higher headache-related disability.
- Headache frequency emerged as one of the strongest correlates of disability.

Introduction

Headache disorders are among the most prevalent neurological conditions in children and adolescents and represent an important contributor to functional impairment during school age [1]. Although headaches are frequently perceived as minor or self-limited complaints, recurrent headache during adolescence can interfere with daily functioning, school attendance, academic performance, sleep quality, emotional well-being, and social participation. This burden is particularly relevant during adolescence, a developmental period characterized by rapid biological, psychological, and social changes, as well as increasing academic and environmental stressors [2].

Primary headache disorders, particularly migraine and tension-type headache TTH, account for a substantial proportion of headache morbidity among adolescents. These conditions may present with variable frequency, intensity, duration, and associated symptoms, resulting in a broad spectrum of clinical and functional consequences [3]. Beyond pain itself, headache-related disability may affect students' ability to concentrate, participate in school activities, maintain regular attendance, and engage in normal social and family life. Therefore, evaluating headache in adolescents requires attention not only to diagnostic classification, but also to disability, health-seeking behavior, coping strategies, and associated psychosocial factors [4].

Several behavioral and psychological factors may be associated with headache occurrence and severity in school-aged populations, including sleep disturbance, psychological stress, anxiety, depression, screen exposure, caffeine intake, smoking, physical inactivity, academic pressure, and menstrual-related symptoms among females [5]. These factors are often interrelated and may contribute to a cycle in which headache, emotional distress, impaired sleep, and reduced academic functioning reinforce one another. Identifying these associations is essential for developing comprehensive school-health strategies that address headache as part of a broader adolescent health framework rather than as an isolated pain complaint.

Despite the recognized burden of headache disorders among adolescents globally and regionally, data from Palestine remain limited, particularly among school-aged students. Most available Palestinian evidence has focused on university or medical student populations, leaving an important gap in understanding headache prevalence, clinical patterns, disability, and associated factors among adolescents in secondary schools. Therefore, this study aimed to assess the prevalence and characteristics of headache disorders among Palestinian adolescents aged 15 to 19 years, evaluate headache-related disability, and examine sociodemographic, lifestyle, psychological, sleep-related, academic, and menstrual factors associated with headache burden.

Methodology

Study design and setting

This was a school-based cross-sectional study conducted among Palestinian adolescents enrolled in secondary schools in the West Bank. The study targeted students from grades 10 to 12 in selected schools located in Hebron, Bethlehem, and Ramallah governorates. A cross-sectional design was selected to estimate the prevalence and distribution of headache disorders and to examine their association with sociodemographic, lifestyle, psychological, sleep-related, academic, and menstrual factors at a single point in time. This study is reported in accordance with the STROBE guidelines for observational studies [6].

Participants

The target population included school-aged adolescents aged 15 to 19 years who were enrolled in grades 10, 11, or 12 during the study period. Students were eligible for inclusion if they were within the specified age range, attended one of the participating schools, and completed the study questionnaire. Students who did not provide consent or submitted substantially incomplete responses were excluded from the relevant analyses.

The minimum required sample size was calculated based on the estimated population of eligible students in the selected governorates, using a 95% confidence level and a 5% margin of error. Although the minimum required sample was approximately 383 students, a larger final sample of 535 students was included to improve statistical precision.

Data collection procedure

Data were collected using a structured, self-administered online questionnaire distributed to eligible students through participating schools. The questionnaire was designed to capture demographic characteristics, academic indicators, lifestyle factors, headache characteristics, headache-related disability, psychological well-being, sleep disturbance, perceived stress, health-seeking behavior, and headache management strategies. For female participants, additional questions assessed menstrual regularity, duration of menstruation, severity of menstrual cramps, and menstrual-related headache.

Participation was voluntary, and students were informed about the purpose of the study before completing the questionnaire. Data were collected anonymously or de-identified during processing to preserve confidentiality. All responses were reviewed for completeness and plausibility before analysis.

Study variables and measurements

The main outcome was headache diagnosis, classified according to symptom-based criteria derived from the International Classification of Headache Disorders, 3rd edition [7]. Headache categories included no headache, non-specific headache, TTH, migraine without aura, migraine with aura, and cluster headache. Headache-related variables included headache frequency, usual headache duration, family history of headache, history of head trauma, doctor visits due to headache, and headache management strategies.

Headache-related disability was assessed using the Pediatric Migraine Disability Assessment Scale PedMIDAS [8]. The total score was calculated by summing responses across the six items and then categorized into disability levels: little to no disability, mild disability, moderate disability, and severe disability as illustrated in the reference. School absence due to headache was also analyzed as a functional outcome.

Psychological and behavioral variables included anxiety, depression, sleep disturbance, and perceived stress. Depression, anxiety, and sleep disturbance were assessed using standardized American Psychiatric Association, level 2 Child Age 11–17 symptom scales, while perceived stress was assessed using a structured perceived stress scale [9-12]. Depression, anxiety and perceived stress scores were interpreted based on their illustrated reference, while the sleep disturbance scale had no available interpretation at the time of writing this manuscript, sleep disturbance was considered little to none (≤ 17) mild (18- 23), moderate (24- 29) and severe (≥ 30) for our analysis. Lifestyle variables included weight and height, usual sleep duration, weekly physical activity, daily screen time, daily study hours, caffeine intake, type of caffeinated drink consumed, and smoking status. Academic variables included school grade and most recent academic average. Menstrual variables were analyzed only among female participants.

Statistical analysis

Data were analyzed using descriptive and inferential statistical methods. Categorical variables were summarized as frequencies and percentages, while continuous variables were summarized using means and standard deviations.

Bivariate analyses were initially performed to examine associations between headache diagnosis, headache-related disability, and potential explanatory variables. Chi-square or Fisher's exact tests were used for categorical variables, while spearman correlation was used for continuous variables and Mann-Whitney U, or Kruskal-Wallis tests were used for continuous and categorical variables.

Variables considered clinically relevant or statistically significant in bivariate analysis were entered into multivariable regression models. Multinomial logistic regression was used to identify factors independently associated with headache diagnosis, using no headache as the reference category where applicable. Ordinal logistic regression was used to examine factors associated with higher headache-related disability levels. Linear regression was used to evaluate predictors of numeric PedMIDAS score and headache-related school absence. Results were reported as odds ratios or beta coefficients with corresponding 95% confidence intervals. A two-sided p-value of less than 0.05 was considered statistically significant.

Ethical Approval

The study protocol, including the questionnaire, recruitment procedure, data collection method, and informed-consent process, was reviewed and approved by the Al-Quds University Research Ethics

Committee. Participation was voluntary, and electronic informed consent was obtained before questionnaire completion. The study was conducted in accordance with the ethical principles of the Declaration of Helsinki, including respect for autonomy, confidentiality, and protection of participant welfare.

Results

A total of 535 students participated in this cross-sectional study, the majority of participants were males (n=285, 53.4%), Most students were aged 16 years (n=205, 38.4%) or 17 years (n=192, 35.9%), with 11th grade being the most represented (n=234, 43.8%), only 18 students (3.4%) reporting separated parents, most had medium household income of 3,000–6,000 NIS per month (n=233, 43.6%). mean body mass index BMI was found to be (22.0±3.6) with (n=372, 69.5%) having normal BMI (18.5-25). The majority reported sleeping 6–8 hours per night (n=238, 44.6%), while a notable proportion had suboptimal sleep duration of only 4–6 hours (n=220, 41.2%). Physical inactivity was common, with 31.1% reporting no weekly sports activity (n=166). Most had a Screen time of 1–3 hours daily (n=242, 45.3%), while daily study load was most commonly 1–3 hours (n=237, 44%). (n=176, 32.9%) Reported consuming at least one caffeinated drink daily, with Tea being the most commonly reported beverage (n=103, 19.3%), Smoking was reported by 15.2% of participants (n=81). Sleep and rest was the most commonly reported approach to manage headache (n=261, 48.9%). (n=215, 40.2%) of students reported none-to-slight anxiety, (n=182, 34.1%) reported moderate depression (n=308, 57.6%) reported moderate sleep disturbance, perceived stress was predominantly moderate (n=287, 53.7%). Menstrual Health Characteristics were filled by females only

(n=249, 46.5%), the majority reported regular menstrual cycles (n=168, 67.5%)

(n=158, 63.4%) reported a cycle duration of 6–7 days, Period cramps were often severe (n=102, 41.0%), moderate period headache was reported by (n=87, 34.9%). *See table (1) for all details regarding descriptive statistics.*

Headache Diagnosis

Only (n=87, 16.3%) reported to have no headache complaint and only (4) had cluster headache. Bivariate analysis showed multiple significant associations that are illustrated in figure (1), after adjusting for confounders by multinomial regression model we found that Migraines with Aura (n=35, 6.5%) can be predicted in students having severe anxiety (OR= 14.8; $P= 0.017$; CI= 1.6- 136.2), highest grade point average GPA (>95%) (OR= 4.9; $P= 0.041$; CI= 1.1- 22.5).

Diagnosis of Migraines without Aura (n=64, 12.0%) could be predicted in those having severe depression (OR= 7.9; $P= 0.007$; CI= 1.8- 35.6) and those with the highest GPA (>95%) (OR= 8.6; $P= 0.0007$; CI= 2.5- 30.0).

Non specific headache (n=220, 41.2%) are those who had a headache complaint but did not fit any of the other diagnoses, it was predicted in students with severe depression (OR= 4.0; $P= 0.0248$; CI= 1.2- 13.5), also those with GPAs (>95%), (90-95%) and (70-80%) had higher odds of having non specific headache (OR= 3.6; $P= 0.02$; CI= 1.2- 10.3), (OR= 2.9; $P= 0.03$; CI= 1.1- 7.3) and (OR= 5.0; $P= 0.002$; CI= 1.8- 13.8) respectively. Students reporting 6-8 hours of night sleep had lower odds of having Non- Specific Headache (OR= 0.47; $P= 0.02$; CI= 0.25- 0.89).

Meanwhile TTH (n=124, 23.2%) was predicted in students with depression regardless of severity but most strongly in those with severe headache (OR= 11.3; $P= 0.0002$; CI= 3.1- 40.7) and in those with GPA (70-80%) (OR= 3.5; $P= 0.03$; CI= 1.2- 10.3), on the other hand those with moderate anxiety and those who usually sleep more than 8 hours at night Had lower odds of having TTH (OR= 0.37; $P= 0.04$; CI= 0.14- 0.94) and (OR= 0.25; $P= 0.03$; CI= 0.074- 0.87) respectively.

PedMIDAS

Bivariate analysis showing potentially significant associated predictors are illustrated in figure (2), ordinal logistic regression was done to control for confounding variables, we found that students suffering from severe depression have higher odds of having a Higher PedMIDAS disability level (OR= 2.8; $P= 0.03$; CI= 1.1- 7.3), in addition to those with longer days of headache in the last month (3-5) and (>5) (OR= 4.8; $P= 0.0001$; CI= 2.3- 10.6) and (OR= 15.2; $P= 0$; CI= 7.1- 33.9) respectively.

The numeric PedMIDAS disability score was also analysed separately using bivariate analysis . Linear regression was done to control for confounders, we found that higher scores are found in those with longer days

of headache in the last month (3-5) and (>5) (B= 10.2; $P= 0$; CI= 6.1- 14.2)

(B= 16.2; $P= 0$; CI= 12.0- 20.4) further supporting the logistic regression findings. In addition we found that lower usual headache duration (<5 min), (5- 30 min) and (30 min- 3 hours) are linked to a decrease in the overall PedMIDAS score (B= -11.8; $P= 0.00004$; CI= -17.4- -6.2), (B= -8.6317; $P= 0.0001$; CI= -13.0- -4.3) and (B= -4.5; $P= 0.045$; CI= -8.9- -0.092) respectively. Students reporting no headache had lower PedMIDAS scores (B= -11.0; $P= 0.006$; CI= -18.9- -3.2). See Figure (3)

All management options for headache lead to a decrease in the PedMIDAS disability level except for the avoiding triggers option, nonetheless these predictors did not reach statistical significance in the ordinal logistic regression.

Days of School Absence

This outcome is already a part of the PedMIDAS scale; binary analysis was used to find potential associations, After adjusting for confounders by linear regression, we found that those with doctor visits due to headache and those with higher sleep disturbance score lead to a slight increase in the rates of

absence from school ($B = 0.65$; $P = 0.01$; $CI = 0.14- 1.17$) and ($B = 0.075$; $P = 0.03$; $CI = 0.008- 0.14$) respectively. See Figure (4)

See supplementary table (1) for Post Hoc power Analysis for regression models

Discussion

In this school-based study of Palestinian adolescents, headache disorders were highly prevalent, with only 16.3% of students reporting no headache complaint. Non-specific headache and TTH were the most common patterns, while migraine with and without aura accounted for a smaller but clinically important share of diagnoses. A substantial subgroup experienced moderate to severe PedMIDAS disability, and headache frequency and severe depression emerged as the strongest correlates of this burden. These findings support viewing adolescent headache as a multidimensional problem spanning pain, mental health, sleep, and school functioning rather than an isolated neurological symptom.

The predominance of non-specific headache likely reflects the difficulty adolescents have describing headache characteristics with diagnostic precision, but this group should not be dismissed, as unclassified headache was still linked to functional impairment. The prominence of TTH is consistent with its known association with stress and academic pressure in school-aged populations [13]. Migraine with and without aura, though less frequent, remains clinically important given its association with greater severity and disability, while the rarity of cluster headache is expected at this age [14]. This heterogeneity indicates that a single, uniform management approach is unlikely to be sufficient.

Headache frequency was among the strongest and most consistent predictors of disability, with students reporting more headache days per month showing markedly higher odds of greater PedMIDAS disability and higher numeric scores [8]. This suggests frequency may be a more informative burden marker than diagnostic category alone, and that simple questions about headache days could help school staff identify students needing further assessment or referral. The association between doctor visits, sleep disturbance, and school absence further supports the interpretation that clinically significant headache directly disrupts education.

Severe depression was consistently associated with multiple headache categories and with greater disability, while severe anxiety showed a strong, though imprecisely estimated, association with migraine with aura. This relationship is likely bidirectional: recurrent headache may drive emotional distress through disrupted attendance and social participation [16], while depression and anxiety may increase headache vulnerability through altered pain processing and sleep disturbance [17,18]. Consistent with this, students sleeping 6–8 hours nightly had lower odds of non-specific headache [19]. Academic indicators showed a more complex pattern, with higher odds of certain headache types at both very high and select lower GPA levels, possibly reflecting academic pressure or perfectionistic tendencies [20]; however, GPA is only an indirect stress marker, and longitudinal data are needed to clarify directionality.

Our prevalence and disability findings align with a Norwegian school-based study by Krogh et al., which similarly found substantial functional impact from adolescent headache, though our overall burden was higher and non-specific headache and TTH predominated, likely reflecting differences in population, recall period, and diagnostic approach [21]. Findings also parallel a Jordanian study by AlBashtawy et al., which reported common TTH, migraine, and unclassified headache among high school students [22], supporting the relevance of headache as a regional school-health issue; our study extends this evidence by incorporating PedMIDAS-based disability and a broader set of psychological, sleep, lifestyle, and menstrual factors. Compared with a Kuwaiti community-based study by Al-Hashel et al., which reported lower prevalence, our substantially higher burden may reflect differences in age range, sampling, and cultural reporting factors; nonetheless, both studies confirm headache as an important source of educational and functional disability in this region [23].

Despite high prevalence and measurable disability, most students did not seek medical care, suggesting headache may be under-recognized or normalized by adolescents, families, and schools. Self-management – chiefly rest, hydration, and trigger avoidance – was more common than clinical consultation [24], underscoring a need for education on when medical evaluation is warranted [25]. Practically, these findings support integrated school-based screening that assesses not only headache frequency and pain but also disability, sleep, depressive and anxiety symptoms, academic difficulties, and menstrual-related headache in female students. Simple, feasible tools could help identify students needing referral to primary care, neurology, or mental health services [26], with psychological support treated as a core component of headache management [27].

Strengths and limitations

This study benefits from a multi-governorate school-based sample, a multidimensional assessment spanning diagnosis, disability, and psychological/lifestyle factors, and the use of PedMIDAS and multivariable regression to strengthen burden assessment and confounding control. Limitations include the cross-sectional design, which precludes causal inference; reliance on self-reported rather than clinically confirmed diagnoses, raising possible recall or misclassification bias; small numbers in some categories (notably migraine with aura and cluster headache), which widened confidence intervals; geographic restriction to selected West Bank governorates, limiting generalizability; and the possibility of residual confounding from unmeasured factors such as family stress or healthcare access.

Future directions

Longitudinal studies are needed to clarify the temporal relationships between headache, psychological distress, sleep, and academic performance, alongside larger, multi-governorate samples using clinically confirmed diagnoses. Interventional research should test school-based programs targeting sleep hygiene, mental health support, and early referral to determine their effect on headache burden and psychosocial outcomes.

Conclusion

Headache disorders are highly prevalent among Palestinian adolescents and carry meaningful functional, psychological, and educational burden. Non-specific headache and TTH were the most common patterns, headache frequency was the strongest marker of disability, and psychological distress – particularly depression and anxiety – was closely linked to both headache diagnosis and impairment. These findings support recognizing adolescent headache as a school- and public-health priority, and integrating headache and disability screening with mental health support, sleep evaluation, and appropriate referral to improve academic and psychosocial outcomes in this population.

Abbreviations

Pediatric Migraine Disability Assessment Scale (PedMIDAS), tension-type headache (TTH), body mass index (BMI), grade point average (GPA).

Declarations

None.

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Conflict of Interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Table

Table (1): Descriptive Statistics summary, presented as frequencies and percentages.

Variable	Category	n	%
Sex	Male	285	53.40%
	Female	249	46.60%
Age (years)	15	71	13.30%
	16	205	38.40%
	17	192	35.90%
	18	65	12.20%
	19	1	0.20%
Grade	10th Grade	106	19.90%
	11th Grade	234	43.80%
	12th Grade	194	36.30%
Family Status	Married	516	96.60%
	Divorced / Separated	18	3.40%
GPA	< 70	86	16.10%
	70–80	99	18.50%
	80–90	173	32.40%
	90–95	94	17.60%
	> 95	82	15.40%
Household Income	< 3,000 NIS	191	35.80%
	3,000–6,000 NIS	233	43.60%
	≥ 6,000 NIS	110	20.60%
BMI	Underweight	70	13.10%
	Normal Weight	372	69.50%
	Overweight	75	14.00%
	Obese	18	3.40%
Menstrual Regularity*	Premenarche	2	0.80%
	Irregular	79	31.70%
	Regular	168	67.50%
Usual Period Duration*	< 3 days	2	0.80%

	3–5 days	71	28.50%
	6–7 days	158	63.40%
	≥ 8 days	18	7.20%
Period Cramps Severity*	No Pain	7	2.80%
	Mild Pain	43	17.30%
	Moderate Pain	97	40.00%
	Severe Pain	102	41.00%
Period-Related Headache*	No Headache	44	17.70%
	Light	71	28.50%
	Moderate	87	34.90%
	Severe	47	18.90%
Headache Diagnosis	No Headache	87	16.30%
	Non-Specific Headache	220	41.20%
	Tension-Type Headache	124	23.20%
	Migraine without Aura	64	12.00%
	Migraine with Aura	35	6.50%
	Cluster Headache	4	0.70%
Head Trauma (Last Year)	No	408	76.40%
	Yes – Mild	101	18.90%
	Yes	25	4.70%
Headache Family History	No	267	50.00%
	Unknown	180	33.70%
	Grandparents / Uncles	18	3.40%
	Parents / Siblings	69	12.90%
Doctor Visit (Headache)	No	461	86.40%
	Yes	73	13.70%
PEDMIDAS Disability	Little to None	245	45.80%
	Mild	161	30.10%
	Moderate	67	12.50%

	Severe	62	11.60%
Sleep and Rest	No	273	51.10%
	Yes	261	48.90%
Hydration	No	397	74.30%
	Yes	137	25.70%
Avoidance of Triggers	No	467	87.40%
	Yes	67	12.60%
Coffee or Tea	No	469	87.80%
	Yes	65	12.20%
Prescribed Analgesic	No	490	91.80%
	Yes	44	8.20%
Unprescribed Analgesic	No	524	98.10%
	Yes	10	1.90%
Usual medications used for headache managment **	missing	211	39.50%
	no	67	12.50%
	Paracetamol	188	35.20%
	NSAID	45	8.40%
	Paracetamol + NSAID	21	3.90%
	Antibiotic	2	0.40%
Anxiety	None to Slight	215	40.20%
	Mild	102	19.10%
	Moderate	168	31.50%
	Severe	49	9.20%
Depression	None to Slight	168	31.50%
	Mild	83	15.50%
	Moderate	182	34.10%
	Severe	101	18.90%
Sleep Disturbance	None to Slight	2	0.40%
	Mild	214	40.10%

	Moderate	308	57.60%
	Severe	10	1.90%
Perceived Stress	Mild	77	14.40%
	Moderate	287	53.70%
	Severe	170	31.80%
Sports (Weekly)	No sports	166	31.10%
	< 1 hour	115	21.50%
	1–2 hours	120	22.50%
	3–4 hours	76	14.20%
	≥ 5 hours	57	10.70%
Screen Time (Daily)	< 1 hour	50	9.40%
	1–3 hours	242	45.30%
	4–6 hours	168	31.50%
	> 6 hours	74	13.90%
Study Hours (Daily)	< 1 hour	60	11.20%
	1–3 hours	237	44.40%
	4–6 hours	164	30.70%
	> 6 hours	73	13.70%
Caffeine Drinks (Daily)	0 drinks	105	19.70%
	1 drink	176	32.90%
	2 drinks	140	26.20%
	3 drinks	61	11.40%
	≥ 4 drinks	53	9.90%
Caffeine Type**	None	254	47.60%
	Tea	103	19.30%
	Coffee	100	18.70%
	Energy Drink	77	14.40%
Smoking	No	453	84.80%
	Yes	81	15.20%

Smoking Duration***	missing	202	37.80%
	no	245	45.90%
	<1 year	34	6.40%
	1-2 years	14	2.60%
	2-3 years	26	4.90%
	>3 years	13	2.40%

* These questions were taken from females only, and the percentages are calculated out of females only (n=249)

** These were open ended questions "non-required answer question"

*** Discrepancy between smokers in this and the previous question is probably due to self-administration

Figures

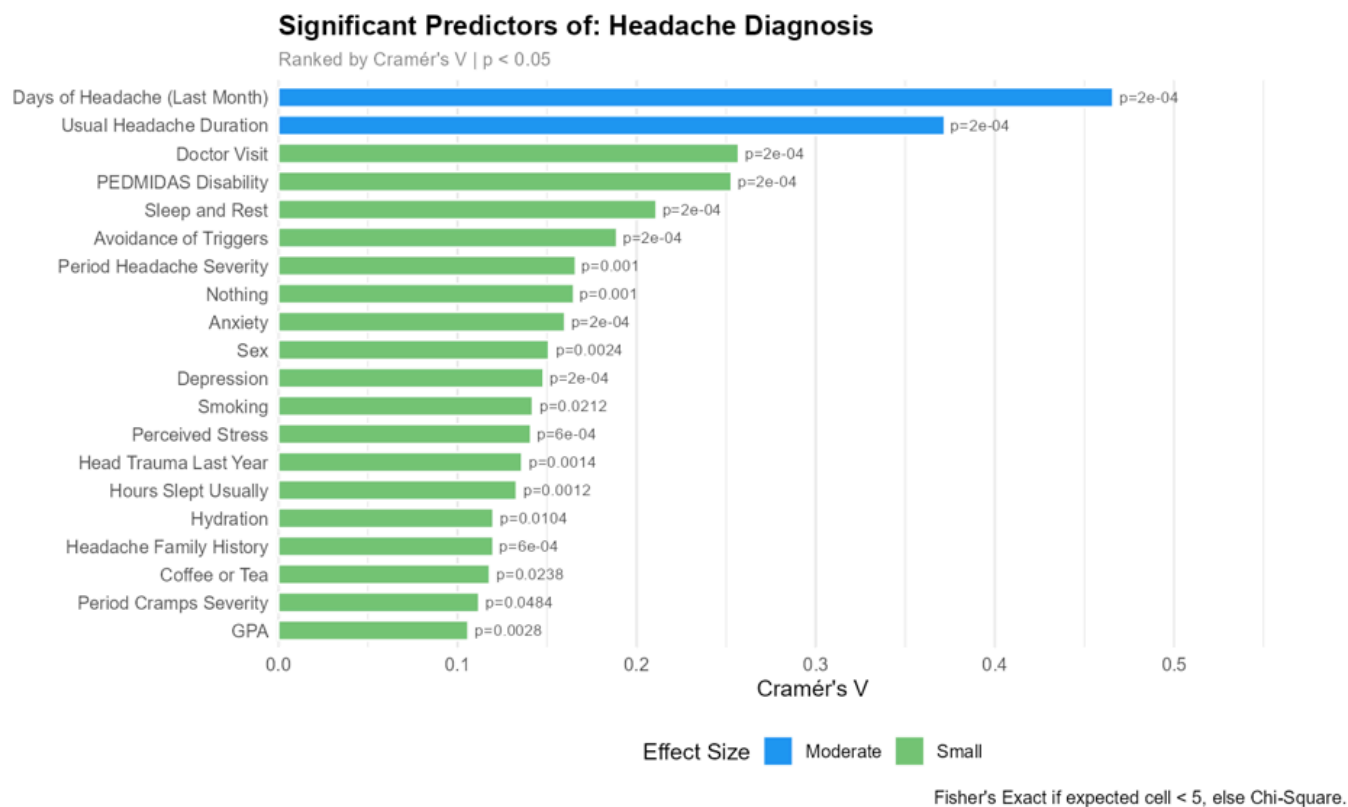


Figure 1

Binary Analysis screening for potential significant predictors for headache type, showing significant associations ($P < 0.05$) using Chi-Square or Fischer's Exact test if all expected cells (< 5), ranked by strength of the association, measured with Cramer's V, illustrated by color.

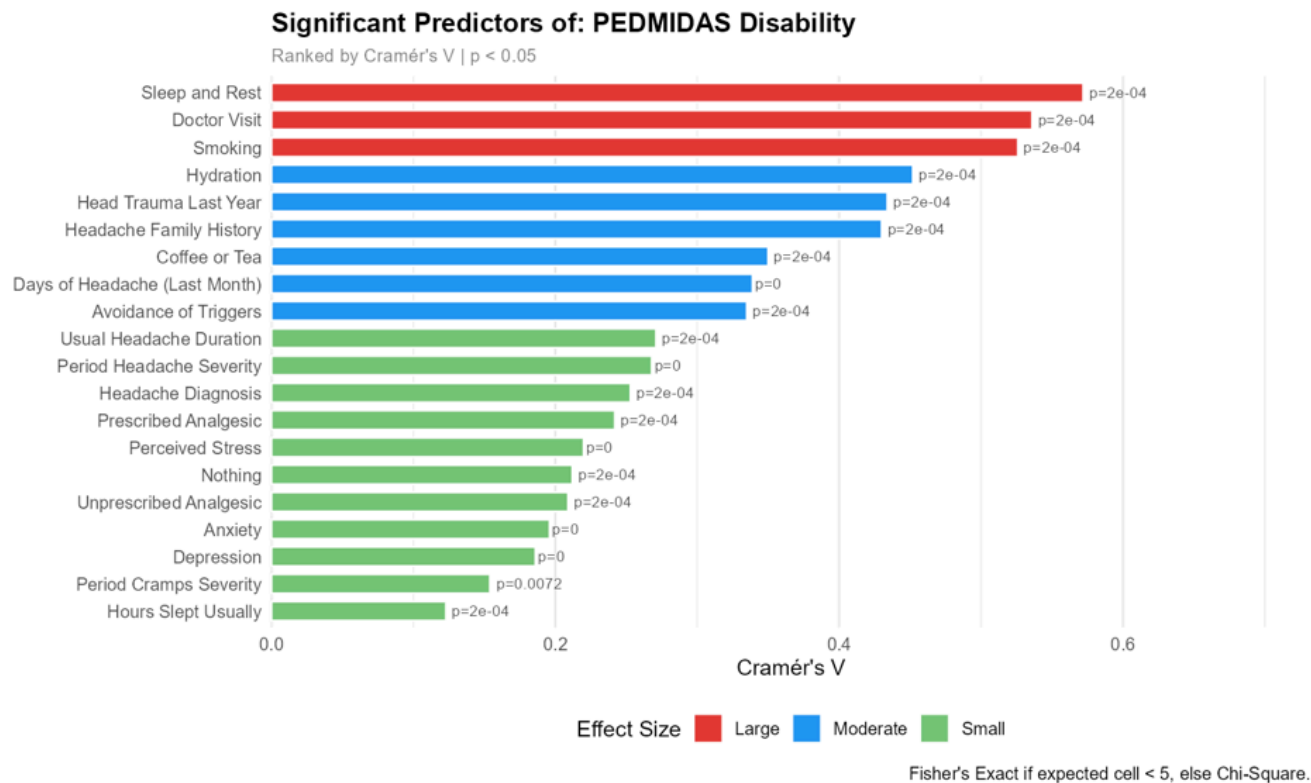


Figure 2

Binary Analysis screening for potential significant predictors for PedMIDAS, showing significant associations ($P < 0.05$) using Chi-Square or Fischer's Exact test if all expected cells (< 5), ranked by strength of the association, measured with Cramer's V, illustrated by color.

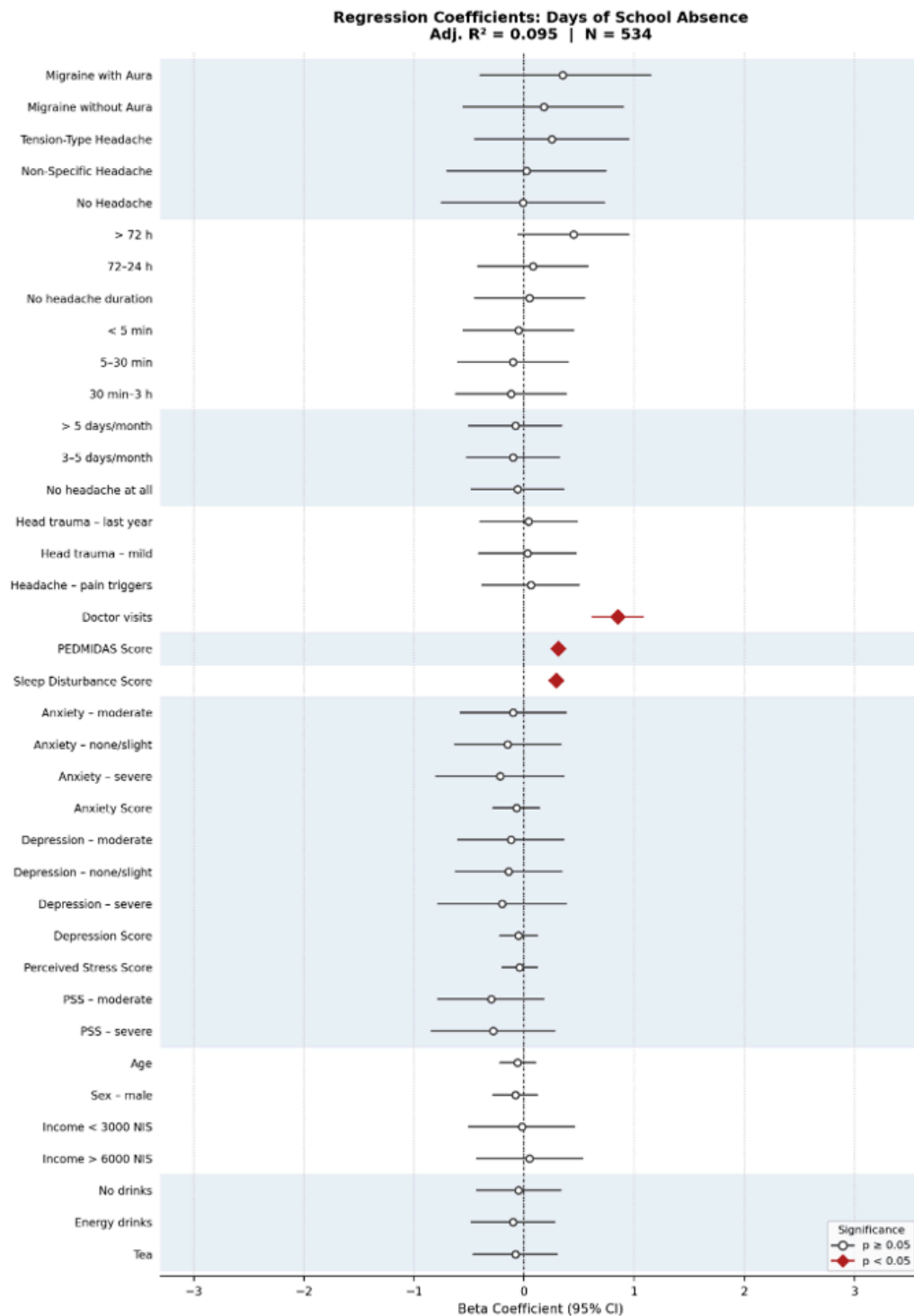


Figure 3

Forest plot showing the results of linear regression for all significant associations –after binary analysis– for PedMIDAS numeric score, with the red plots showing statistically significant predictors ($P < 0.05$). Note that School absence is part of the PedMIDAS.

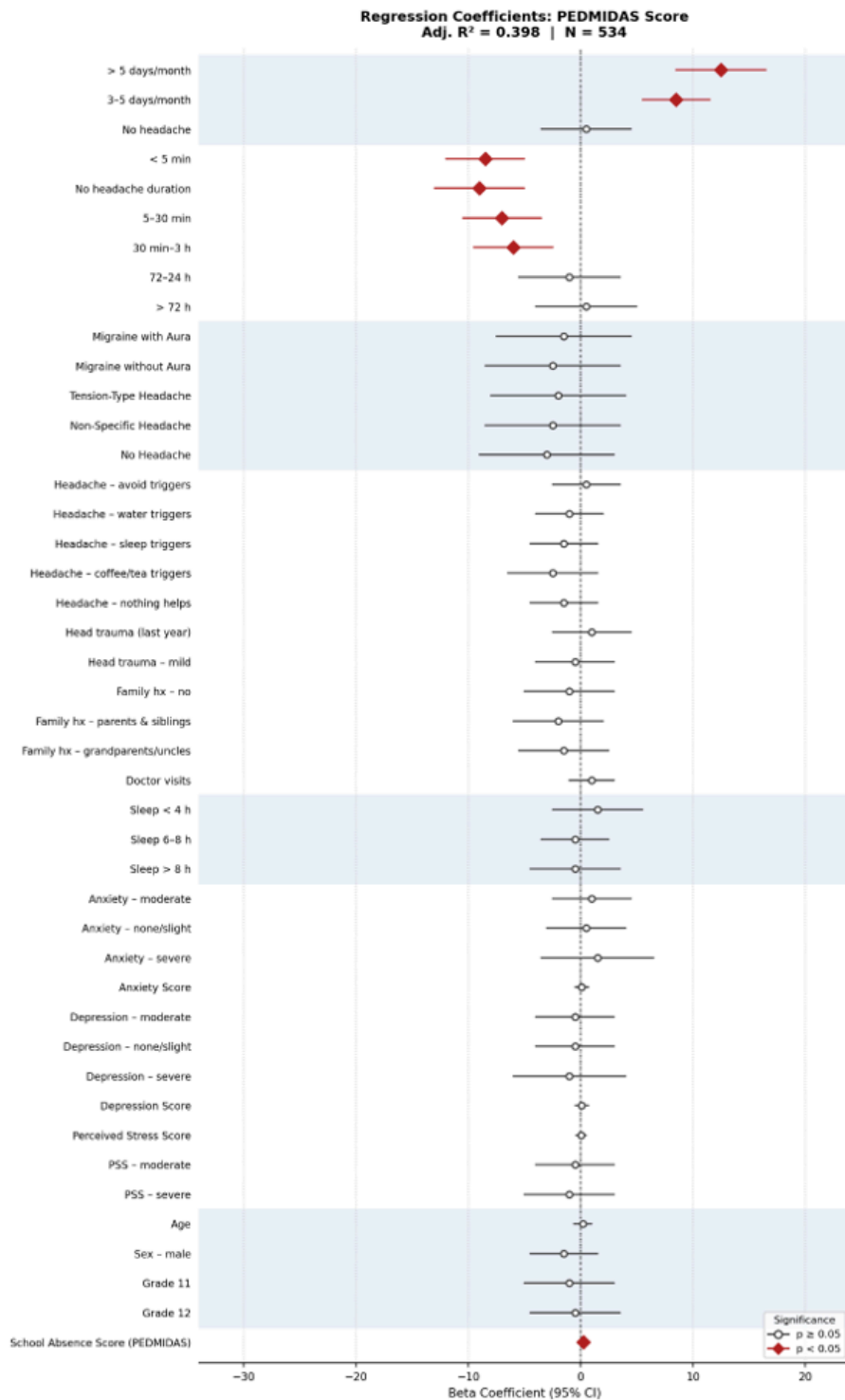


Figure 4

Forest plot showing the results of linear regression for all significant associations –after binary analysis– for the days of school absence, with the red plots showing statistically significant predictors ($P < 0.05$). Note that School absence is part of the PedMIDAS.

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [Headachediagnosticcriteria.docx](#)
- [HeadacheSurveyAmongSchoolStudents.docx](#)
- [STROBEChecklistCrossSectionalHA.docx](#)
- [SupplemenataryTable1.xlsx](#)
- [Supplementarymaterial.docx](#)