Journal of Health, Wellness and Community Research
ISSN: 3007, 0570

OPEN ACCESS

JHWCR

Type: Original Article
Published: 31 December 2025
Volume: III, **Issue**: XIX
DOI: https://doi.org/10.61919/xqsccg04

Correspondence
✉ Maha Tahir, tahir.maha123@gmail.com

Received 21, 10, 25 **Accepted** 18, 12, 2025

Authors' Contributions
Concept: MT, MZ; Design: MA, RR, NN; Data Collection: MT, MZ, KM, IH; Analysis: MT, MZ; Drafting: MT

Declarations
No funding was received for this study. The authors declare no conflict of interest. The study received ethical approval. All participants provided informed consent.

"Click to Cite"

Comparison of Disability Due to Migraine with Aura Among Male and Female Bankers

Maha Tahir[1], Mehrab Zafarullah[1], Kashaf Mukhtar[1], Inam-ul-Haq[1], Maryam Afzal[1], Raveena Rajpoot[1], Nayab Naina[1]

[1] University of Sialkot, Sialkot, Pakistan

ABSTRACT

Background: Migraine with aura (MwA) is a disabling neurological condition that can be amplified by high-stress occupations such as banking. Objective: To compare MwA-related disability between male and female bankers in Sialkot, Pakistan. Methods: A cross-sectional study was conducted among 357 bankers (178 males, 179 females) aged 25–40 years with ≥1 year of permanent employment who met ICHD-3 criteria for MwA. Migraine screening was performed using the Migraine Screening Questionnaire (MSQ), and disability was quantified using the Migraine Disability Assessment (MIDAS). Non-normality supported non-parametric testing; Mann–Whitney U compared MIDAS total (MidasSum) distributions by gender, and Chi-square tested association between gender and MIDAS grades. Results: Mean age was 32.88±5.10 years in males and 30.17±4.05 years in females. MIDAS grades in males were: Grade I 18.5%, Grade II 43.3%, Grade III 25.3%, Grade IV 12.9%; in females: Grade I 14.0%, Grade II 26.3%, Grade III 41.3%, Grade IV 18.4%. Gender was significantly associated with MIDAS grade ($\chi^2(3)=17.21$, $p=.001$), and females had higher disability ranks (mean rank 198.98 vs 158.90). Conclusion: Female bankers with MwA demonstrated higher disability severity than males, with a shift toward moderate disability, supporting gender-responsive workplace prevention and accommodation strategies.

Keywords

Migraine with aura; MIDAS; MSQ; disability; bankers; ICHD-3.

INTRODUCTION

Migraine is a leading neurological cause of disability worldwide, with substantial impairment in function, social participation, and work productivity, and its disability burden has increased over recent decades (1). Migraine with aura (MwA) represents a distinct subtype defined by transient, fully reversible neurological symptoms—most commonly visual, sensory, or speech disturbances—that precede or accompany headache attacks and reflect specific neurobiological mechanisms and clinical trajectories (2). Contemporary clinical descriptions emphasize MwA as a phased disorder (prodrome, aura, headache, postdrome), in which symptom timing, reversibility, and functional disruption collectively shape disability beyond pain intensity alone (3). Triggers and contextual exposures further modulate attack frequency and severity, meaning that occupational and behavioral environments can amplify disability even when diagnostic criteria remain stable (4).

Sex-related differences in migraine are consistently reported across populations, with women experiencing a higher overall burden than men, and evidence indicating that sex differences extend beyond prevalence to include disability severity, health-care utilization, and treatment patterns (5,6). Biological mechanisms—particularly reproductive hormonal milestones and fluctuations—are implicated in migraine expression and may influence attack frequency, symptom profiles, and disability trajectories among women of working age (6). In parallel, sex and gender-related social determinants, including differential role expectations and cumulative responsibilities outside formal employment, may compound stress exposure and functional consequences, thereby widening observed disability gaps even within the same occupational strata (7). Conversely, migraine in men is increasingly recognized as clinically consequential and potentially under-characterized in disability reporting and care-seeking, reinforcing the need for direct, context-specific comparisons rather than inference from prevalence patterns alone (12).

Banking is a high-demand occupational context characterized by sustained cognitive load, prolonged screen exposure, time pressure, and sedentary work routines, all of which have been associated with migraine symptoms and disability in employed populations (8). Workplace consequences of migraine are driven not only by absenteeism but also by presenteeism and reduced performance while at work, which can produce substantial economic and organizational costs and motivate the need for structured accommodations and targeted interventions (9,10). Although workplace research has documented migraine-related productivity loss and has proposed intervention strategies in employed adults, evidence focused specifically on MwA-related disability patterns by sex within banking remains limited, particularly in Pakistan where occupational health supports and migraine-specific workplace frameworks are variably implemented (8–10). A direct comparison of disability distributions and overall disability scores in male and female bankers with confirmed MwA can therefore clarify whether sex-linked gradients in functional impact persist within a shared high-stress work environment and can inform gender-sensitive screening and workplace mitigation strategies.

Accordingly, this study aimed to compare disability due to migraine with aura between male and female bankers in Sialkot, Pakistan, using the Migraine Disability Assessment (MIDAS) grading distribution and overall MIDAS disability scores as the primary comparative disability metrics. We hypothesized that female bankers with MwA would demonstrate a higher disability burden than male bankers, reflected by a shift toward higher MIDAS grades and higher overall disability scores (11).

MATERIALS AND METHODS

A cross-sectional observational study was conducted over a six-month period in Sialkot district, Pakistan, after approval from the institutional research committee. Data were collected from multiple banks within the district using a purposive sampling approach intended to recruit working-

DOI: https://doi.org/10.61919/xqsccg04

age bankers exposed to routine occupational triggers relevant to migraine disability. The target sample size (n = 357) was estimated using Raosoft software assuming a 95% confidence level, 5% margin of error, an estimated population size of 5000, and a 50% response distribution.

Eligible participants were male or female bankers aged 25–40 years who were permanent employees with more than one year of service and who met diagnostic criteria for migraine with aura based on the International Classification of Headache Disorders, 3rd edition (ICHD-3). Consistent with ICHD-3, MwA diagnosis required recurrent attacks with aura symptoms that were fully reversible and met specified features related to symptom evolution and timing (2). Pregnant females and individuals with suspected secondary causes of headache or neurological symptoms, including head trauma, sinusitis, or other neurological diseases, were excluded to reduce diagnostic misclassification and confounding from non-migraine etiologies.

After written informed consent, participants completed a structured questionnaire administered in person by the research team. The instrument captured demographic variables (age, gender, and years of experience) and migraine-related screening and characterization. Initial screening used the Migraine Screening Questionnaire (MSQ), a 5-item yes/no tool derived from established diagnostic features, with previously reported sensitivity of approximately 0.93 and specificity of approximately 0.81; a score of at least 4 was considered a positive migraine screen (13). Participants screening positive were assessed against ICHD-3 criteria to confirm MwA by documenting aura symptom type(s) and core temporal and phenomenological features (e.g., gradual spread over ≥5 minutes, successive symptoms, symptom duration 5–60 minutes, and unilateral symptom occurrence) as required for MwA classification (2). Disability was quantified using the Migraine Disability Assessment (MIDAS), a 5-item instrument measuring days of missed activity and days with reduced productivity in occupational, household, and social domains over the preceding three months; total MIDAS scores were categorized into Grade I (0–5; little/no disability), Grade II (6–10; mild), Grade III (11–20; moderate), and Grade IV (≥21; severe) (14). MIDAS has demonstrated acceptable validity and reliability in prior validation work, supporting its use for disability stratification in migraine populations (14).

To enhance data integrity and reduce measurement bias, questionnaires were administered using standardized instructions and a uniform sequence (MSQ screening, ICHD-3 confirmation, then MIDAS disability assessment) to minimize order effects and ensure consistent operationalization of MwA and disability constructs. Data were coded using predefined category labels for MIDAS grades and were entered into a structured database for analysis. The primary comparative outcomes were (i) the distribution of MIDAS disability grades by gender and (ii) the overall MIDAS total score distribution between genders.

Statistical analyses were performed using SPSS Statistics (version 26.0). Distributional assumptions for continuous outcomes were assessed using the Shapiro–Wilk test, and non-normal distributions informed the prespecified use of non-parametric testing for MIDAS total score comparisons. The Mann–Whitney U test was used to compare MIDAS total scores between male and female participants, and the Chi-square test of independence was used to evaluate the association between gender and MIDAS disability grade categories. A two-sided p-value of ≤0.05 was considered statistically significant. Ethical standards were maintained throughout, with institutional approval, voluntary participation, and written informed consent obtained from all participants prior to enrollment.

RESULTS

A total of 357 bankers participated, including 178 males (49.9%) and 179 females (50.1%), with a mean age of 32.88 ± 5.10 years among males and 30.17 ± 4.05 years among females (Table 1). On migraine symptom screening, 269 participants (75.4%) endorsed four symptoms and 88 (24.6%) endorsed all five symptoms on the MSQ. Aura phenotype was heterogeneous, with visual aura reported by 235/357 (65.8%), sensory disturbances by 211/357 (59.1%), motor disturbances by 174/357 (48.7%), brainstem-related symptoms by 154/357 (43.1%), speech difficulties by 146/357 (40.9%), and retinal disturbances by 96/357 (26.9%), while key temporal features supporting MwA diagnosis were frequent (gradual spread ≥5 minutes: 80.1%; successive symptoms: 69.5%; duration 5–60 minutes: 77.9%; unilateral symptoms: 72.3%) (Table 1).

Table 1. Participant Characteristics and Migraine With Aura Profile (N = 357)

Variable	Total (N=357)	Male (n=178)	Female (n=179)
Age (years), mean ± SD	—	32.88 ± 5.10	30.17 ± 4.05
MSQ symptoms = 4, n (%)	269 (75.4)	—	—
MSQ symptoms = 5, n (%)	88 (24.6)	—	—
≥2 MwA attacks lifetime, n (%)	357 (100)	—	—
Visual aura, n (%)	235 (65.8)	—	—
Sensory disturbances, n (%)	211 (59.1)	—	—
Speech difficulties, n (%)	146 (40.9)	—	—
Motor disturbances, n (%)	174 (48.7)	—	—
Brainstem-related symptoms, n (%)	154 (43.1)	—	—
Retinal disturbances, n (%)	96 (26.9)	—	—
Gradual spread ≥5 minutes, %	80.1	—	—
Successive aura symptoms, %	69.5	—	—
Aura duration 5–60 minutes, %	77.9	—	—
Unilateral symptoms, %	72.3	—	—

Disability severity differed by gender across MIDAS grades (Table 2). Among males, Grade II (mild disability) predominated (77/178; 43.3%), while among females Grade III (moderate disability) was most common (74/179; 41.3%). Severe disability (Grade IV) occurred in 12.9% of males versus 18.4% of females, and little/no disability (Grade I) was observed in 18.5% of males and 14.0% of females. The association between gender and MIDAS grade distribution was statistically significant ($\chi^2(3)=17.21$, p=0.001) with a small-to-moderate effect magnitude (Cramér's V=0.219), and the ordinal trend across worsening disability levels was supported by the linear-by-linear association ($\chi^2(1)=10.04$, p=0.002) (Table 2).

Table 2. Gender Association With MIDAS Disability Grades (N = 357)

MIDAS Grade	Male (n=178) n (%)			Female (n=179) n (%)	Total (N=357) n (%)
Grade I (Little/no disability)	33 (18.5)			25 (14.0)	58 (16.2)
Grade II (Mild disability)	77 (43.3)			47 (26.3)	124 (34.7)
Grade III (Moderate disability)	45 (25.3)			74 (41.3)	119 (33.3)
Grade IV (Severe disability)	23 (12.9)			33 (18.4)	56 (15.7)
Test	Statistic	df	p-value	Effect size	
Chi-square (Pearson)	17.21	3	0.001	Cramér's V = 0.219	
Likelihood ratio	17.37	3	0.001	—	
Linear-by-linear association	10.04	1	0.002	—	

Table 3. Gender Difference in MIDAS Total Score (MidasSum): Mann–Whitney U Test (N = 357)

Outcome	Male (n=178)	Female (n=179)	Test statistic	p-value	Effect size
Mean rank	158.90	198.98	U = 12,354	<0.001	r = 0.194
Sum of ranks	28,285.00	35,618.00	z = −3.669	0.00024	Rank-biserial r = 0.225

Table 4. Clinically Actionable Disability Burden: Moderate–Severe (Grades III–IV) vs Little–Mild (Grades I–II)

Disability burden grouping	Male (n=178) n (%)	Female (n=179) n (%)	Comparative effect (Female vs Male)
Little–Mild (Grades I–II)	110 (61.8)	72 (40.2)	—
Moderate–Severe (Grades III–IV)	68 (38.2)	107 (59.8)	RD = 21.6% (95% CI 11.4–31.7) RR = 1.56 (95% CI 1.25–1.95) OR = 2.40 (95% CI 1.57–3.68)

Consistent with grade shifts, overall disability burden was higher in females based on MIDAS total score ranks (Table 3). Females demonstrated a higher mean rank (198.98) than males (158.90), corresponding to a statistically significant difference (Mann–Whitney U=12,354; z=−3.669; p=0.00024) with a small-to-moderate rank-based effect (r=0.194; rank-biserial r=0.225) (Table 3). When MIDAS grades were aggregated into a clinically actionable burden outcome, moderate–severe disability (Grades III–IV) was present in 59.8% (107/179) of females compared with 38.2% (68/178) of males, yielding an absolute difference of 21.6 percentage points (95% CI 11.4–31.7), a relative risk of 1.56 (95% CI 1.25–1.95), and an odds ratio of 2.40 (95% CI 1.57–3.68) for females versus males (Table 4).

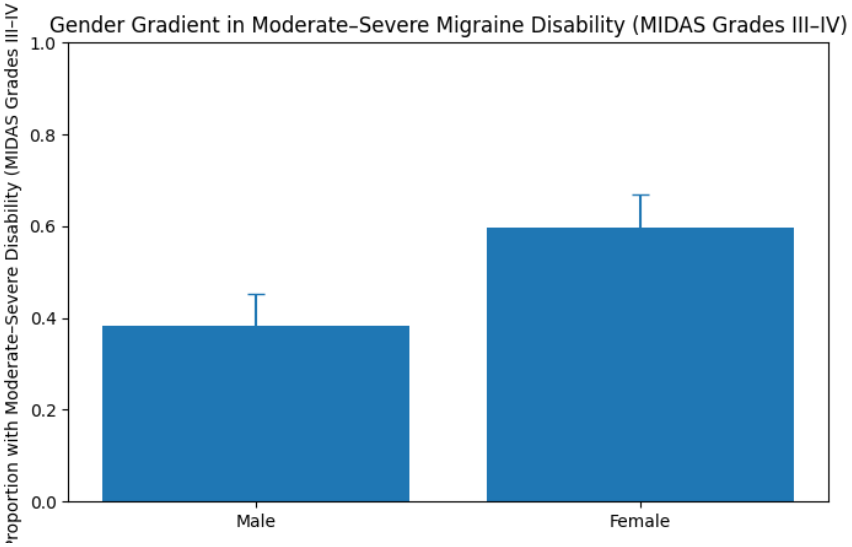

Figure 1. Gender Gradient in Moderate–Severe Migraine Disability (MIDAS Grades III–IV)

Female bankers demonstrated a higher prevalence of clinically meaningful disability burden, with 59.8% (107/179) classified as moderate–severe disability (MIDAS Grades III–IV) compared with 38.2% (68/178) in males, representing an absolute increase of 21.6 percentage points. This burden elevation corresponded to a 56% higher risk in females (RR=1.56; 95% CI 1.25–1.95) and 2.40-fold higher odds of moderate–severe disability (OR=2.40; 95% CI 1.57–3.68), reinforcing a clear gender-linked gradient in function-impairing MwA disability within the banking workforce.

DISCUSSION

In this occupational sample of bankers with migraine with aura (MwA), disability burden differed materially by gender, with females demonstrating a higher overall disability profile. Although men and women were nearly equally represented (178 vs 179), females were disproportionately concentrated in moderate disability (Grade III: 41.3%) and severe disability (Grade IV: 18.4%), whereas males more frequently reported mild disability (Grade II: 43.3%) and had lower proportions in Grade III (25.3%) and Grade IV (12.9%). The association between gender and MIDAS grade was statistically significant ($\chi^2(3)=17.21$, p=.001), and the ordinal trend across disability levels was also significant (linear-by-linear $\chi^2(1)=10.04$, p=.002). The non-parametric comparison of MIDAS total (MidasSum) further supported this gradient, as females had higher mean ranks than males (198.98 vs 158.90), indicating systematically higher disability scores in women.

These findings are biologically plausible because migraine expression and burden are modulated by sex hormones and reproductive milestones, particularly in women of working age, where hormonal fluctuation has been repeatedly implicated in migraine frequency, severity, and functional impairment (6,9). Additionally, sex- and gender-linked differences extend beyond prevalence to disability, healthcare utilization, and treatment patterns, suggesting that the observed workplace disability gradient reflects both biological susceptibility and contextual factors (7). In parallel, trigger profiles and vulnerability to trigger accumulation differ by sex; large database evidence shows sex differences in trigger prevalence even after accounting for attack frequency and migraine subtype, supporting the concept of differential trigger sensitivity that can translate into differential disability (5). Given that banking work environments commonly entail prolonged screen exposure, time pressure, sustained cognitive load, and constrained rest opportunities, these stressors may amplify disability—particularly for those with higher susceptibility or concurrent non-work demands (8).

From an occupational health perspective, the practical implication is that presenteeism and functional impairment may be more prominent in female bankers with MwA, which is consistent with evidence that the major productivity loss in migraine is often attributable to reduced performance at work rather than absence (10). Workplace-focused accommodations and structured interventions (e.g., workload pacing, optimized lighting/screen ergonomics, protected break routines, and migraine education/management programs) have been associated with improved productivity outcomes in migraine populations and are therefore directly relevant to banking-sector mitigation strategies (4,10). In Pakistan, occupation-linked migraine burden has been reported in other high-exposure groups, reinforcing the importance of contextual workplace risk factors in shaping disability distributions (15).

This study should be interpreted in light of limitations that affect inference and generalizability. The cross-sectional design precludes temporal or causal conclusions, purposive sampling from one city limits external validity, and self-reported disability measures may introduce recall or reporting bias despite the established validity of MIDAS and the screening/diagnostic approach used (2,14). Additionally, important confounders—such as precise job role, workload intensity, sleep quality, analgesic overuse, comorbid anxiety/depression, and hormonal status—were not modeled and could partially explain observed gender differences (7,9). Future multicenter, longitudinal studies with stratification by job function and prespecified adjustment for key confounders are warranted to confirm the observed gender gradient, quantify effect sizes more precisely, and identify modifiable occupational determinants of MwA disability in banking settings (4,10).

CONCLUSION

Among bankers with migraine with aura in Sialkot, disability burden differed significantly by gender, with females showing a higher concentration of moderate-to-severe MIDAS grades and higher overall disability ranks than males; these findings support the need for gender-responsive workplace screening, education, and accommodation strategies to reduce functional impairment and productivity losses associated with MwA (4,7,10).

REFERENCES

1. Singh AH, Bathla M, Gupta P, Bhusri L. Quality of sleep and disability associated with headache: migraine versus tension-type headache: a comparative study. Ann Afr Med. 2023;22(1):11–17.
2. Headache Classification Committee of the International Headache Society (IHS). The International Classification of Headache Disorders, 3rd edition. Cephalalgia. 2018;38(1):1–211. doi:10.1177/0333102417738202.
3. Lucas C. Migraine with aura. Rev Neurol (Paris). 2021;177(7):779–784. doi:10.1016/j.neurol.2021.07.010.
4. Begasse de Dhaem O, Gharedaghi MH, Bain P, Hettie G, Loder E, Buse DC, et al. Identification of work accommodations and interventions associated with work productivity in adults with migraine: a scoping review. Cephalalgia. 2021;41(6):760–773. doi:10.1177/0333102420977852.
5. van Casteren DS, Verhagen IE, Onderwater GLJ, van den Maagdenberg AMJM, Terwindt GM. Sex differences in prevalence of migraine trigger factors: a cross-sectional study. Cephalalgia. 2021;41(6):643–648. doi:10.1177/0333102420974362.
6. Kim S, Park JW. Migraines in women: a focus on reproductive events and hormonal milestones. Headache Pain Res. 2024;25(1):3–15.
7. Ahmad SR, Rosendale N. Sex and gender considerations in episodic migraine. Curr Pain Headache Rep. 2022;26(7):505–516. doi:10.1007/s11916-022-01052-8.
8. Wei D, Loganathan T, Wong LP. Employees of the banking sector in Guizhou Province in China: prevalence of migraine, symptoms, disability and occupational risk factors. J Headache Pain. 2023;24:52. doi:10.1186/s10194-023-01591-4.
9. Martinelli D, Pocora MM, De Icco R, Putortì A, Tassorelli C. Triggers of migraine: where do we stand? Curr Opin Neurol. 2022;35(3):360–366. doi:10.1097/WCO.0000000000001065.
10. Begasse de Dhaem O, Sakai F. Migraine in the workplace. eNeurologicalSci. 2022;27:100408. doi:10.1016/j.ensci.2022.100408.
11. Haw NJL, Cabaluna IT, Kaw GE, Cortez JF, Chua MP, Guce K, et al. A cross-sectional study on the burden and impact of migraine on work productivity and quality of life in selected workplaces in the Philippines. J Headache Pain. 2020;21:125. doi:10.1186/s10194-020-01191-6.
12. Fitzek MP, Boucherie DM, de Vries T, Handtmann C, Fathi H, Raffaelli B, et al. Migraine in men. J Headache Pain. 2025;26(1):3. doi:10.1186/s10194-024-01936-7.
13. Láinez MJ, Domínguez M, Rejas J, Palacios G, Arriaza E, García-García M, et al. Development and validation of the Migraine Screen Questionnaire (MS-Q). Headache. 2005;45(10):1328–1338.
14. Ferreira PL, Luzeiro I, Lopes M, Jorge A, Silva B, Ferreira L. Validity and reliability of the Portuguese version of the modified Migraine Disability Assessment. BMC Neurol. 2021;21:58. doi:10.1186/s12883-021-02085-z.
15. Asif M, Khalid M, et al. Prevalence of Migraine and Associated Disability Among Auto-Rickshaw Drivers in Lahore During Summer. J Mod Health Rehabil Sci. 2025;ID 20–ID 20.