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Diagnosis challenges and accessibility barriers to migraine management in Southeast Asia: results from the South-East Asia Local breAch on MigraiNe Treatment (SEALANT) study

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Abstract

Background Migraine is one of the leading causes of disability among all neurological diseases, yet major gaps persist in diagnosis and access to effective treatment, particularly in low- and middle-income regions. Southeast Asia and East Asia are characterised by marked socioeconomic diversity, variable healthcare infrastructure, and limited availability of migraine-specific therapies. We aimed to assess physician-reported barriers to migraine diagnosis and management across Southeast Asian and East Asian countries.

Methods The South-East Asia Local breAch on MigraiNe Treatment (SEALANT) study was a multinational, cross-sectional, web-based survey conducted between Nov 1, 2024, and Aug 31, 2025. Physicians involved in migraine care from Laos, Indonesia, Malaysia, the Philippines, Singapore, Taiwan, and Thailand were eligible. Survey domains included diagnostic barriers, clinic accessibility, acute and preventive treatment practices, awareness of medication overuse headache, access to calcitonin gene-related peptide (CGRP)–targeted therapies, and migraine-related stigma. Countries were categorised by World Bank income classification. Data were analysed descriptively, and comparisons were made across income groups. All results are based on physicians' perceptions of routine clinical practice rather than objectively verified patient-level data.

Results A total of 686 physicians participated (mean age 39.0 years [SD 9.9]), of whom 79.8% were neurologists. Overall, 70.0% of respondents reported an insufficient number of neurology/headache clinics, increasing to 87.2% in lower-middle-income countries. Physicians reported that approximately 60.0% of patients were correctly diagnosed with migraine before specialist consultation, while 44.9% were perceived to experience diagnostic delays exceeding one year. According to physician reports, acute migraine management relied predominantly on non-specific analgesics, with opioids remaining widely available and prescribed across all income settings. Reported use

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of migraine-specific acute therapies and preventive treatments was limited. Although CGRP-targeted preventive therapies were widely regarded by physicians as effective (77.1%), many perceived that these treatments should not yet be reimbursed.

Conclusion Substantial and inequitable gaps persist in migraine diagnosis and management across Southeast Asia and East Asia, as perceived by physicians, driven by shortages of specialist services, delayed diagnosis, reliance on non-specific treatments, and restricted access to migraine-specific therapies. Addressing migraine as a public health priority through health-system strengthening, education, and equitable access to evidence-based treatments is essential to reduce disability in the region.

Keywords Migraine, Southeast Asia, East Asia, Access to care, Diagnosis barriers, Unmet needs, CGRP-targeted therapy

Introduction

Although migraine is a highly prevalent neurological disorder, affecting more than 14% of the global population, it remains largely neglected, often dismissed as an "invisible disability." [1] Despite substantial advances in therapeutic options, migraine continues to be underdiagnosed, undertreated, and with limited access to appropriate care, particularly in low- and middle-income countries. Globally, migraine ranks as the second leading cause of disability, accounting for 45.1 million years lived with disability (YLDs), or approximately 5.6% of the total global disease burden, making it one of the most disabling neurological disorders [2]. The impact of migraine is most pronounced among individuals aged 35 to 39 years, coinciding with peak years of productivity. While effective acute and preventive therapies are well established, the translation of evidence-based guidelines into real-world clinical practice remains inconsistent, perpetuating gaps in migraine care [3].

Underdiagnosis of migraine remains one of the major contributors to the overall burden, adversely affecting patients' quality of life and imposing substantial economic costs at both individual and societal levels. Despite the high prevalence of migraine, diagnostic accuracy among physicians—particularly non-headache specialists—remains unacceptably low. Studies indicate that accurate migraine diagnosis at the first medical visit occurs in no more than 60% of cases [4], with general practitioners achieving correct diagnoses in only 28% of patients and specialist-trained physicians in 35% in a large transcontinental cohort [5]. Diagnostic delays further compound this problem; an Italian study reported that more than 50% of patients required over five years to receive a definitive diagnosis [6]. Such misdiagnosis and prolonged delays lead to inappropriate treatment, persistent disability, and potential progression from episodic to chronic migraine, and underpin the emerging concept of medication underuse headache (MUH), which reflects missed opportunities for timely and adequate migraine management [7–9].

The management of migraine is well established in numerous international and national guidelines, positions, and consensus statements [10–12]. However, the real-world application of these recommendations remains inadequate. This treatment gap may, in part, be attributed to the complex nature of migraine, which necessitates an individualized approach. Moreover, disparities in treatment access, specialist availability, and socioeconomic inequalities further contribute to suboptimal care. Findings from The Observational Survey of the Epidemiology, Treatment and Care of Migraine (OVERCOME) studies highlight this gap. Among patients eligible for acute migraine medications, only 30% were receiving them, and among those eligible for preventive therapy, merely 23% were treated accordingly [13, 14]. In Asia, a study from Taiwan reported that over 80% of patients relied on acute medications, likely reflecting the easy access of over-the-counter pain relievers in many parts of the continent [15]. This easy availability poses additional risk for medication overuse headache (MOH) [16, 17]. In contrast, the use of preventive therapy among Asian populations remains comparably low, similar to the underuse observed in Western countries [13, 15].

Southeast and East Asia are diverse regions in which limited healthcare infrastructure, shortages of trained specialists, and inequitable access to effective therapies further widen the treatment gap. Cultural perceptions, lack of awareness, and inconsistent healthcare policies exacerbate these disparities, resulting in a large proportion of patients remaining undiagnosed or inadequately treated. These challenges underscore the urgent need to evaluate real-world access to migraine diagnosis and management across the region. The South-East Asia Local breAch on MigraiNe Treatment (SEALANT) study aimed to identify physicians' perspectives on barriers and unmet needs in migraine care across Southeast Asian countries, with the primary objective of determining physician's perspective of unmet needs related to migraine diagnosis, treatment, and disability.

Methods

Study design and participants

The SEALANT study was a multinational, cross-sectional, online survey designed to explore physicians' perspectives on migraine diagnosis and management. Participants were recruited between November 2024 and August 2025 from seven countries across Southeast and East Asia–Laos, Indonesia, Malaysia, the Philippines, Singapore, Taiwan, and Thailand–representing diverse demographic, economic, and healthcare contexts (Fig. 1). The survey instrument was collaboratively developed by the study investigators and administered through a secure online platform to ensure confidentiality and data integrity. Each participating country designated a national representative who served as the primary coordinator responsible for local distribution, participant engagement, and data facilitation. The survey was conducted in English and disseminated via QR codes and web-based links circulated through medical societies, professional colleges, academic institutions, hospitals, and royal colleges in participating countries. Eligible participants were physicians who met the following criteria: (1) held a valid medical license in their respective country; (2) practiced in one of the following specialties: neurology, neurosurgery, internal medicine, family medicine, general practice, or others; (3) had clinical experience in managing patients with migraine; and (4) were able to read and communicate in English. Electronic informed consent was obtained from all participants prior to their participation, and all responses were collected anonymously.

Study countries

The study included seven countries across Southeast and East Asia, each reflecting distinct demographic, economic, and healthcare landscapes. Thailand has a population of approximately 71 million, a GDP per capita of US $7,171.81, and around 800 neurologists, yielding a neurologist density of 1.1 per 100,000 [18–20]. Malaysia has 34 million people, a GDP per capita of US $11,648.67, and about 150 neurologists (0.4 per 100,000) [21–23]. Singapore, with a population of 5 million, reports a GDP per capita of US $84,734.26 and approximately 140 neurologists (2.8 per 100,000) [24–26]. Taiwan has 23 million inhabitants, a GDP per capita of US $65,746, and roughly 1,000 neurologists (4.3 per 100,000) [27, 28]. The Philippines has 117 million citizens, a GDP per capita of US $3,725.55, and about 739 neurologists (0.63 per 100,000) [26, 29, 30]. Indonesia, with 277 million people, has a GDP per capita of US $4,940.55 and approximately 1,200 neurologists (0.43 per 100,000) [26, 31, 32]. Finally, Laos, the least resourced country in the cohort, has 7.8 million people, a GDP per capita of roughly US $2,100, and 13 neurologists (≤ 0.1 per 100,000) [26, 33, 34] (Fig. 1).

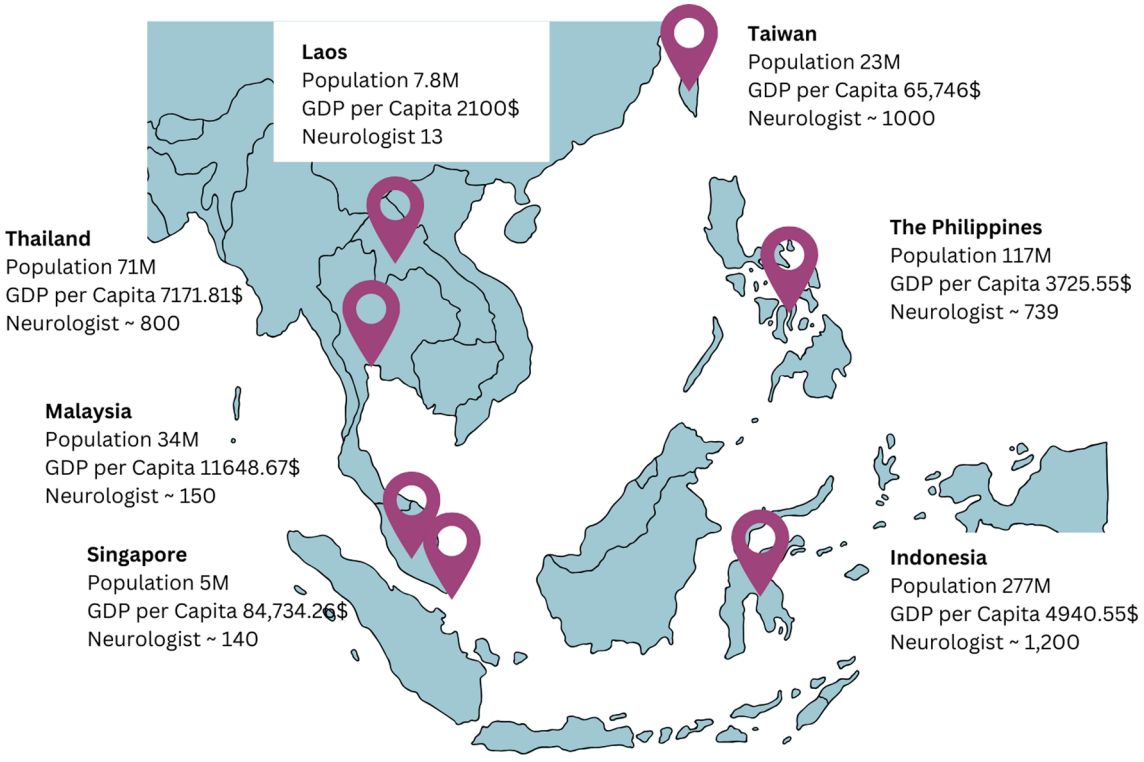

Fig. 1 Included Southeast and East Asian countries with their population size, gross domestic product per capita, and number of neurologists. Abbreviations: GDP, gross domestic product

Questionnaire development and validation

The SEALANT questionnaire was initially developed by a group of neurologists and headache specialists in Thailand with extensive experience in migraine care. Questionnaire items were generated based on a comprehensive review of the existing literature on migraine diagnosis, management barriers, and migraine therapies, together with the clinical expertise of the study investigators. To establish content validity, the draft questionnaire was reviewed by an independent group of neurologists and headache specialists to ensure relevance, clarity, and appropriateness across different healthcare systems. Minor revisions were made based on this expert feedback to improve wording and contextual applicability.

The questionnaire was subsequently pilot tested among a small group of physicians in Thailand involved in migraine care to assess clarity, comprehensibility, and completion time. Feedback from pilot testing was used to refine item phrasing and response options. Given the exploratory and descriptive nature of the study, formal psychometric testing was not undertaken. The revised questionnaire was then circulated to investigators in other participating countries for additional feedback prior to implementation.

Survey and outcomes

The survey comprised five main sections, each designed to explore different aspects of migraine care and physician perspectives. Section "1" collected demographic data. Section "2" focused on barriers to migraine diagnosis, covering issues such as diagnostic accuracy, time to diagnosis, hospital workload, and use of headache diaries and patient education. Section "3" explored acute migraine treatment, including medication availability, the proportion of patients using acute medications, issues of medication underuse (timing and efficacy), and awareness of MOH. Section "4" explored preventive treatment, including access to preventive medications, availability of calcitonin gene-related peptide (CGRP)–targeted therapies, and physicians' views on their use. Section "5" explored migraine-related stigma and its impact on patients' quality of life; these findings will be reported separately. To minimize the risk of repeated responses, the survey platform was configured to restrict multiple submissions from the same user. In addition, participants were instructed to complete the survey only once, and responses were reviewed for obvious duplication or identical response patterns prior to analysis. Missing data were handled using a complete-case approach. Analyses were performed using available data for each survey item and no imputation was applied.

The primary outcomes included physician-reported diagnostic accuracy and delay, barriers to headache and migraine diagnosis, patterns of acute migraine treatment (including use of non-specific analgesics and opioids), reasons for non-prescription of acute and preventive therapies, awareness of MOH, and access to preventive treatments including CGRP–targeted therapies.

Statistical analysis

Data were summarized as frequency and percentage for categorical variables, and as median interquartile range (IQR) for continuous variables. Countries were categorized according to the World Bank Group's income classification: high income countries (HIC; Singapore and Taiwan); upper-middle income countries (UMIC; Indonesia, Malaysia, and Thailand); and lower-middle income countries (LMIC; Laos and The Philippines). Differences between groups were assessed using Pearson's chi-square test, Fisher exact test, or Kruskal-Wallis test, as appropriate. All statistical analysis were performed using Stata/SE 17.0 (StataCorp, College Station, TX, USA).

Ethical statements

This study was conducted in accordance with the principles outlined in the Declaration of Helsinki and the International Conference on Harmonisation–Good Clinical Practice (ICH-GCP). Ethical approval was obtained from the Institutional Review Board of King Mongkut's Institute of Technology Ladkrabang, Bangkok, Thailand (EC-KMITL_67_132), and local ethics approvals were secured in participating countries where applicable. All participants provided informed consent prior to participation in the study.

Results

Participants characteristics

A total of 686 participants were included in the analysis. The median age of participants was 36 (IQR: 33–44) years, with an approximately equal distribution between male and female physicians. The majority of participants were neurologists (79.8%), followed by general practitioners (6.3%) and internists (6.0%), while only 4.5% were headache specialists. Most of our participants were from UMIC (69.1%). Notably, participants from HIC were more likely to be headache specialists compared to others (Table 1). Detailed country-specific participant responses are presented in Supplementary Table 1.

Barriers to migraine diagnosis

Neurology/headache clinics

In this study, neurology/headache clinics were defined as clinics in which a neurologist or headache specialist provides care for patients with migraine. Given the scarcity of neurologists in many settings, access to a neurology clinic was considered the minimum requirement

Table 1 Baseline characteristics of participants classified according to the world bank group's world economic classification

Characteristics	Overall (*N* = 686)	HIC (*N* = 48)	UMIC (*N* = 474)	LMIC (*N* = 164)	*p*
Median age (IQR), y	36 (33–44)	39 (34–46)	35 (31–42)	40 (34–52)	< 0.001
Sex					0.06
Female	346 (54.4%)	17 (37.8%)	243 (56.4%)	86 (53.8%)	
Male	290 (45.6%)	28 (62.2%)	188 (43.6%)	74 (46.2%)	
Specialty					< 0.001
Headache specialist	31 (4.5%)	9 (19.6%)	15 (3.2%)	7 (4.3%)	
Neurologist	545 (79.8%)	27 (58.7%)	397 (83.9%)	121 (73.8%)	
Internist	41 (6.0%)	6 (13.0%)	11 (2.3%)	24 (14.6%)	
Family medicine	15 (2.2%)	4 (8.7%)	10 (2.1%)	1 (0.6%)	
General practitioner	43 (6.3%)	0 (0.0%)	37 (7.8%)	6 (3.7%)	
Others	8 (1.2%)	0 (0.0%)	3 (0.6%)	5 (3.1%)	

Abbreviations: HIC, high income countries; IQR, inter quartile range; LMIC, lower-middle income countries; UMIC, upper-middle income countries

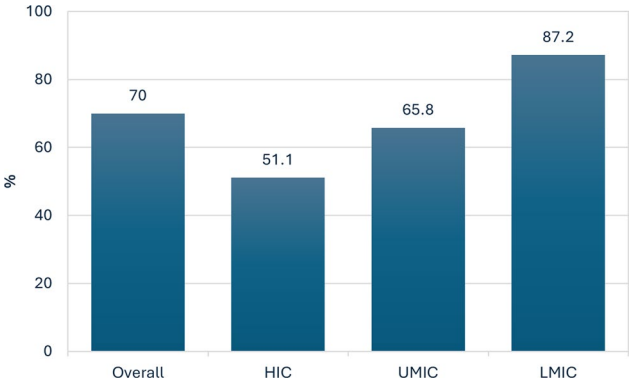

Fig. 2 Percentages of physicians who believe there are insufficient neurology/headache clinics in their country. Abbreviations: HIC, high income countries; LMIC, lower-middle income countries; UMIC, upper-middle income countries

for the diagnosis of migraine. The majority of physicians reported that the number of available neurology/headache clinics in their country was insufficient. Overall, 70% of respondents believed that there were not enough neurology/headache clinics to meet patient needs. When analyzed by World Bank income classification, this perception declined with increasing national income level, 87.2% in LMIC, 65.8% UMIC, and 51.1% in HIC ($p < 0.001$) (Fig. 2, Table 2). Despite the limited number of clinics, 58.3% of physicians indicated that their patients typically waited less than one week for an appointment. However, the consultation time available for each patient remained constrained, with 59.4% of physicians reporting that they could spend no more than 15 min per visit (Supplementary Fig. 1).

Diagnosis accuracy and consultation focus

Across all income groups, there was general agreement that neurologists were responsible for establishing a migraine diagnosis (69.7%). However, when asked whether patients had already received a correct diagnosis prior to their consultation, only 57.2% of doctors believed so (Fig. 3A). Notably, physicians from HIC reported a higher rate of accurate prior diagnosis compared to those from middle-income settings (73.3% vs. 52.7% vs. 66.0% for HIC, UMIC, and LMIC, respectively) (Table 2, Supplementary Fig. 2). Possibly owing to limited consultation time, physician views that 44.9% of patients took more than 1 year to get a correct diagnosis. Furthermore, most physicians prioritized discussing pharmacological treatment (86.0%) over general migraine education, including pathophysiology, triggers, and non-pharmacological strategies (75.7%), while disease burden was least discussed (68.1%) (Fig. 3C, D and E). Overall, 58.9% of physicians reported that their patients regularly used a headache diary (Fig. 3B). Interestingly, this practice was more common in LMIC compared to UMIC and HIC (Table 2, Supplementary Fig. 2).

Pharmacological treatment

Regarding acute migraine treatment, non-steroidal anti-inflammatory drugs (NSAIDs) were the most widely available medications across participating facilities (96.8%), followed by acetaminophen or paracetamol (87.8%) and tramadol (76.1%). Of concern, tramadol was reported to be more accessible than triptans or gepants. The availability of opioids also varied by economic level, being highest in LMIC (90.2%), followed by UMIC (73.0%) and HIC (58.3%). For preventive therapy, tricyclic antidepressants (TCAs) and antiseizure medications (ASMs) were the most accessible (91.1%), followed by beta-blockers (89.9%). In contrast, migraine-specific preventive therapies, particularly CGRP-targeted treatments, were rarely available, reported in only 53% of centers across the region (Supplement Fig. 3). These findings highlight the significant unmet need for access to migraine-specific therapies in Southeast and East Asia.

Acute treatment usage and risk of medication overuse headache

Most physicians (81.1%) agreed that their patients were eager to use acute medications for migraine attacks (Fig. 4A). However, only 28.5% of doctors reported that their patients reported using migraine-specific agents such as triptans (Fig. 4B). In contrast, opioids, which are not recommended by any major treatment guidelines, were still prescribed by 76.2% of doctors for migraine

Table 2 Summary of key response characteristics stratified by world bank group income classification

Characteristics	HIC (*N* = 48)	UMIC (*N* = 474)	LMIC (*N* = 164)	*P*
Belief that headache clinics are insufficient to meet patient needs (% yes)	23 (51.1%)	312 (65.8%)	143 (87.2%)	< 0.001
Consultation time per headache patient				< 0.001
< 15 min	33 (71.7%)	330 (69.6%)	45 (27.4%)	
15–30 min	13 (28.3%)	120 (25.3%)	83 (50.6%)	
> 30 min	0 (0.0%)	24 (5.1%)	36 (22.0%)	
Key aspects of migraine management (% reporting "always" or "usually")				
Correct migraine diagnosis	33 (73.3%)	250 (52.7%)	107 (66.0%)	< 0.001
Use of headache diaries	30 (65.2%)	259 (54.8%)	113 (69.3%)	0.003
Explanation of general migraine knowledge	33 (71.7%)	332 (70.6%)	149 (91.4%)	< 0.001
Discussion of migraine burden and impairment	29 (63.0%)	302 (63.8%)	134 (82.2%)	< 0.001
Discussion of acute and preventive options	35 (76.1%)	405 (85.4%)	149 (90.9%)	0.028
Acute and preventive medication practices (% reporting "always" or "usually", unless otherwise noted)				
Patients' frequent use of acute medication	40 (88.9%)	373 (78.9%)	140 (85.4%)	0.072
Prescription of triptans	26 (56.5%)	104 (22.1%)	64 (39.0%)	< 0.001
Prescription of opioids (% reporting "never")	21 (46.7%)	104 (22.0%)	37 (22.7%)	< 0.001
Patients know limits of acute medications	33 (71.7%)	133 (28.1%)	71 (43.3%)	< 0.001
Prescription of preventive medication	29 (63.0%)	282 (59.9%)	104 (63.4%)	0.69
Perspectives on anti-CGRP therapy (% reporting "agree")				
Perceived clinical efficacy	39 (86.7%)	351 (74.2%)	136 (82.9%)	0.021
Acceptable side-effect profile	38 (82.6%)	271 (57.7%)	96 (58.9%)	0.004
Support for reimbursement inclusion	35 (76.1%)	303 (64.5%)	136 (83.4%)	< 0.001

Abbreviations: CGRP, calcitonin gene-related peptide; HIC, high income countries; lower-middle income countries; UMIC, upper-middleincome countries

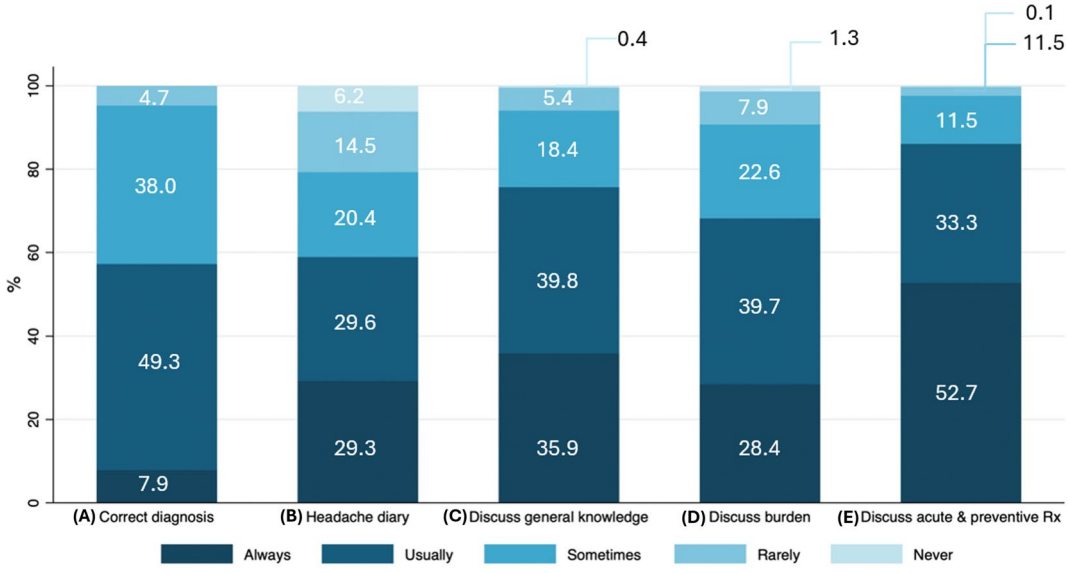

Fig. 3 Percentages of physicians reporting key aspects of migraine management: (**A**) Correct migraine diagnosis prior to consultation; (**B**) Patients' use of headache diaries; (**C**) Explanation of general migraine knowledge during clinic visit; (**D**) Discussion of migraine burden and impairment during clinic visit; (**E**) Discussion of acute and preventive medications during clinic visit

management (Fig. 4C). Of these, frequent prescribers accounted for only 7.8% of respondents, whereas the majority were occasional prescribers (68.4%). When analyzed by economic status, HIC reported a greater use of triptans (56.5%) and a higher proportion of physicians who never used opioids (46.7%) compared with others (Table 2, Supplementary Fig. 4). These findings highlight a gap between clinical practice and guideline-based recommendations in acute migraine therapy across the region. Regarding MOH, only 34.7% of patients were reported to understand the recommended limits of older acute medication use and the risk of developing MOH (Fig. 4D). However, economic status seems to play a role. In HIC, 71.7% of patients were aware of the recommended limits

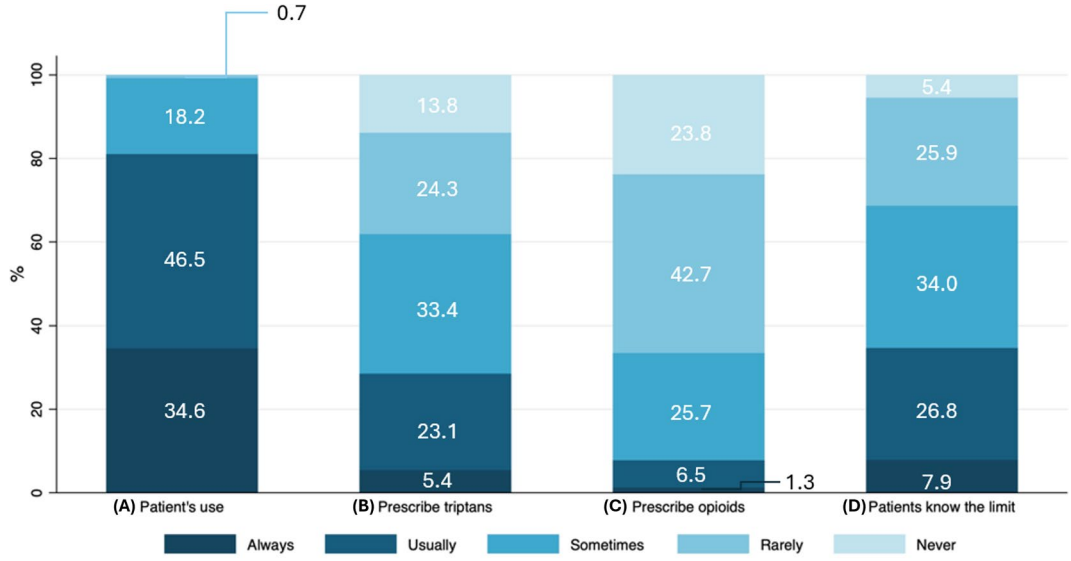

Fig. 4 Percentages of physicians' perspectives on acute medication practices: (**A**) Patients' frequent use of acute medication; (**B**) Prescription of triptans; (**C**) Prescription of opioids; (**D**) Patients know limits of acute medication to avoid medication overuse headache

for older acute medication use, whereas awareness was substantially lower in UMIC (43.3%) and LMIC (28.1%) (Table 2, Supplementary Fig. 4).

Acute treatment barriers

Despite the widespread use of acute medications, physicians also identified several challenges associated with their use. The most frequently reported issue was cost (32.8%), followed by insufficient efficacy (27.5%) and adverse effects (22.5%). In HIC, limited efficacy seems to be the issue, whereas in LMIC and UMIC, cost seems to be the main concern. These findings further emphasize the unmet needs in acute migraine management, particularly regarding affordability, treatment effectiveness, and tolerability.

Preventive therapy gaps and CGRP targeted therapies

In contrast to acute treatments, preventive medications were prescribed to 60% of patients (always and usually) (Supplementary Fig. 5). The main reasons for not initiating preventive therapy were tolerability concerns (29.1%), followed by cost (28.6%) and limited efficacy (26.5%). However, when considering economic status, cost is an issue for LMIC, while tolerability was a major concern for HIC. The oral route was the preferred mode of administration (97.1%), whereas only a small proportion favored injectable formulations via subcutaneous or intravenous routes. Physicians' attitudes toward the newer agents were mixed. While 77.1% believed migraine-specific preventive medications are clinically effective and 59.7% considered them to have fewer side effects than conventional options, only 69.8% felt they should be reimbursed (Fig. 5A and B, 5 C). Notably, a subset of physicians acknowledged the drugs' efficacy but still viewed them as not cost-effective or worth the money. This finding is consistent across all economic groups.

Discussion

This study represents the first multinational survey to explore physicians' perspectives on access to migraine diagnosis and treatment across Southeast and East Asia. The findings reveal significant gaps and inequalities in migraine care, influenced by socioeconomic and healthcare disparities across the region. Overall, the study highlights three major themes: diagnosis barriers, particularly inaccurate diagnosis and shortage of Headache and Neurology clinics; treatment gaps, including underuse of migraine-specific therapies and reliance on opioids; and economic barriers that continue to shape access to care and medication availability.

Diagnostic barriers pose one of the major obstacles in effective migraine management. While most physicians agreed that neurologists are primarily responsible for diagnosing migraine, only 60% believed that their patients had been accurately diagnosed prior to consultation. This diagnostic inaccuracy likely contributes to delays in treatment initiation and may facilitate progression toward chronic migraine [35]. The lower diagnostic accuracy observed in the region may be influenced by socioeconomic factors, as physicians from HIC reported greater diagnostic accuracy compared with those from UMIC and LMIC [36]. Additional contributing factors include the limited number of dedicated neurology/headache clinics, with most physicians believing that their country lacks sufficient facilities and education [37–40], and restricted consultation time, as 59.4% of physicians

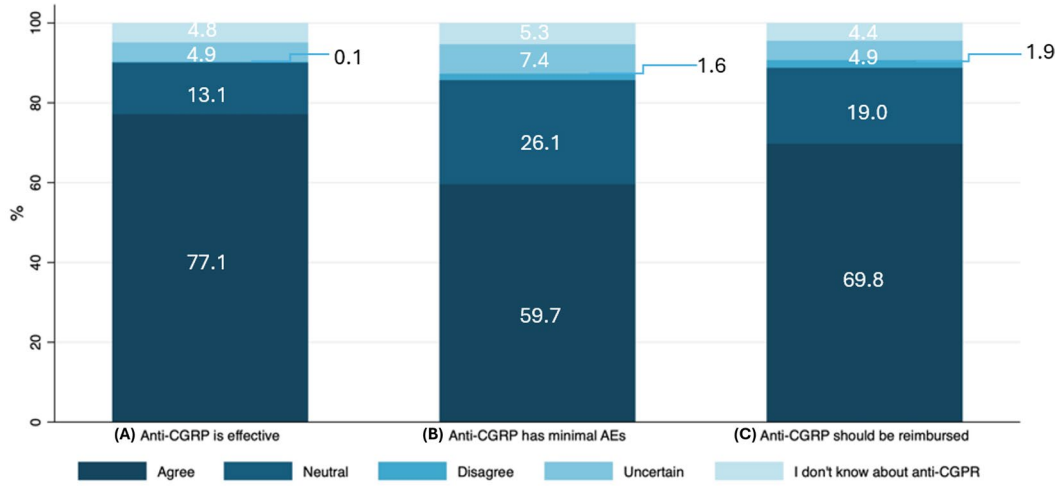

Fig. 5 Percentages of physicians' perspectives on anti-CGRP therapy: (**A**) Perceived clinical efficacy; (**B**) Acceptable side-effect profile; and (**C**) Support for reimbursement inclusion. Abbreviations: AEs, adverse events; Anti-CGRP, anti-calcitonin gene-related peptide therapy

reported spending no more than 15 min per patient, likely due to high patient volume and workload demands [41, 42]. On average, the recommended consultation time in Europe is around 45 min per visit [43].

When compared with developed countries such as Singapore, which has approximately 35,000 patients per one neurologist, Laos, on the other hand, has only one neurologist per one million people [26]. This striking disparity highlights the significant inequality in neurological care capacity across the region. When time is a major constraint, patient–physician discussions may be limited, which may lead physicians to prioritize certain topics over others [44]. Most physicians reported focusing primarily on pharmacological treatment, while education about migraine pathophysiology, triggers, and disease burden was discussed far less frequently. This is consistent with real-world clinical practice. The American Migraine Communication Study by Lipton et al. found that physicians spent an average of only 12 min per visit discussing migraine and focused primarily on attack frequency, with limited attention given to functional impairment [45]. The clinical imbalance of time contributes to patients' limited understanding of the disease, reducing their ability to recognize early warning signs or adhere to preventive strategies [46, 47]. Despite these resource-limited circumstances, one positive aspect from our survey was that more than half of physicians indicated that their patients typically waited less than one week for an appointment, which is shorter than the global average time of 3.7 months for the first visit and 2.5 months for the follow-up visits, as reported in a previous multinational survey [40]. Waiting times vary depending on the type and structure of the clinic [40]. One observation from these countries that differs substantially from Western settings is that waiting times are relatively short despite perceived insufficiency of neurology/headache clinics. Further exploration suggests that this reflects healthcare systems in which patients can directly access neurology clinics, including those in the private sector. However, the overwhelming number of patients results in limited consultation time per visit. In other words, access is characterized by shorter waiting times but shorter consultation times.

Treatment utilization concerns were evident across the region and aligned with the previous survey in the Asian Oceanian regions during 2020–2021 [48]. Compared with global patterns, Southeast and East Asia appeared to rely more on acute medications (81.1%), possibly due to greater accessibility of over-the-counter drugs and ease of direct from pharmacy access. This pattern may also be related to a sense of self-management, i.e., patient's perception that "I can handle it myself with OTC medicine," as reported in the OVERCOME Japan study [17]. However, most patients used non-specific analgesics rather than migraine-specific agents, which may lead to suboptimal efficacy and was identified as a key issue in this study [49]. Of greater concern, the use of opioids, which are discouraged in all major migraine treatment guidelines, remains widespread and may increase the risk of MOH [12, 50, 51]. Although the majority of opioid prescribing was occasional, this practice still poses a risk of MOH. Lastly, the widespread availability of acute medications, combined with limited understanding of usage limits for the older acute treatments, has contributed to a growing incidence of MOH. Therefore, increasing physician awareness and education regarding MOH may play an important role in its prevention [52]. Moreover, high socioeconomic status seems to be a factor preventing this problem in this region.

Preventive medications, on the other hand, appear to be underutilized across the region. This may be because most preventives are not migraine-specific and are often

associated with more side effects [53]. Lower utilization, limited efficacy, and higher adverse effects align with previous studies showing that only 20–30% of patients remain adherent to the older non-specific preventive therapies after one year [54]. Additionally, most preventive treatments in Southeast and East Asia are not reimbursable, requiring patients to pay out of pocket [55, 56]. Although medication prices in Southeast and East Asia are generally lower than in developed countries based on equity in pharmaceutical pricing, they remain disproportionately high relative to average monthly income, making many therapies, especially CGRP-targeted treatments, largely inaccessible for most patients [57].

CGRP-targeted therapies including monoclonal antibodies and gepants are well recognized for their clinical efficacy, and physicians in Southeast and East Asia generally share positive views regarding their effectiveness [58, 59]. However, a considerable proportion of doctors still believe that, despite their proven efficacy, these treatments are not worth the cost or reimbursement. It remains unclear whether this perception reflects genuine concerns regarding cost-effectiveness or instead stems from unfamiliarity with, or limited use of, these therapies. Either way, this perspective may reflect a broader regional issue in which migraine is often undervalued as a disabling disease, potentially leading to insufficient prioritization in healthcare funding and policy. Further studies on awareness and regional campaigns are necessary to elevate the understanding of migraine to patients, healthcare providers, and policy makers [60].

Limitations

This study has several limitations. First, the cross-sectional, web-based survey design may have introduced selection bias, favoring physicians who are already interested or actively involved in migraine management. Second, the findings are based on physicians' perspectives and self-reported perceptions, which may not fully reflect actual clinical practice or objectively measured patient-level data. Third, although the study included seven countries across Southeast and East Asia, participation was uneven across nations, potentially limiting the representativeness of individual countries. In addition, English was the sole language used in the survey, which may have affected comprehension among some respondents. Furthermore, because the survey was disseminated through national societies and professional colleges, the total number of physicians invited could not be determined, precluding calculation of a response rate. Despite these limitations, the large sample size and multi-country participation provide valuable insights into real-world practice patterns and access issues across the region.

Future directions

Future studies should aim to include a broader representation of countries and incorporate both physician and patient perspectives to better characterize regional gaps in migraine care. Longitudinal research are needed to examine changes in diagnostic practices, treatment patterns, and access to care over time. In addition, health-economic evaluations are warranted to assess the cost-effectiveness and reimbursement feasibility of modern migraine therapies in Southeast and East Asia. Regional collaboration among medical societies, policymakers, and public health authorities will be essential to translate research findings into sustainable strategies.

These findings also have direct implications for health-system action. Targeted training programs for general practitioners and non-headache specialists may improve early recognition and diagnosis of migraine, particularly in settings with limited specialist availability. At the policy level, Ministries of Health may consider integrating migraine prevention and management into national disease strategies, with emphasis on early diagnosis, appropriate use of migraine-specific therapies, and prevention of medication overuse headache. Standardized referral pathways between primary care and neurology/headache services could optimize specialist access and consultation efficiency. In parallel, opioid prevention programs and guideline-aligned prescribing policies are needed to reduce inappropriate opioid use in migraine care. Finally, reimbursement approaches tailored to local healthcare systems may help improve access to migraine-specific preventive treatments while keeping costs manageable.

Conclusion

Based on physicians' perspectives, the SEALANT study identifies substantial unmet needs in migraine diagnosis and management across Southeast and East Asia. Physicians reported diagnostic challenges related to limited availability of neurology/headache clinics, short consultation times, and constrained opportunities for patient education, alongside treatment gaps characterized by frequent use of non-specific analgesics and restricted access to migraine-specific preventive therapies. These findings reflect perceived challenges in routine clinical practice and highlight areas where targeted education, health-system strengthening, and context-appropriate policy measures may help improve migraine care delivery in the region.

Abbreviations

AEs	Adverse events
ASM	Anti-seizure medication
CGRP	Calcitonin gene-related peptide
DALYs	Disability-adjusted life-years
GDP	Gross domestic product
HIC	High-income country
IQR	Interquartile range

LMIC	Lower-middle-income country
MOH	Medication overuse headache
MUH	Medication underuse headache
NSAIDs	Non-steroidal anti-inflammatory drugs
OTC	Over-the-counter
SEALANT	South-East Asia Local breAch on MigraiNe Treatment
SD	Standard deviation
UMIC	Upper-middle-income country
YLDs	Years lived with disability

Supplementary Information

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Supplementary Material 1

Supplementary Material 2

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Author contributions
WR, AH, and PA designed the study, developed the questionnaire, collected data, conducted the analyses, and drafted the manuscript. TP, STP, and STW developed the questionnaire and contributed to data interpretation. NM, WAWS, GS, JLW, GD, ISM, DAS, PB, JWW, and AP were responsible for questionnaire distribution and data collection in their respective countries. SJT provided analytical guidance, editing, and intellectual input. All authors read, edited and approved the final version of the manuscript.

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Data availability
The original data could be shared on request to the corresponding author.

Declarations

Ethical approval
This study was conducted in accordance with the principles outlined in the Declaration of Helsinki and the International Conference on Harmonisation–Good Clinical Practice (ICH-GCP). Ethical approval was obtained from the Institutional Review Board of King Mongkut's Institute of Technology Ladkrabang, Bangkok, Thailand (EC-KMITL_67_132), and local ethics approvals were secured in participating countries where applicable.

Consent for publication
Not applicable.

Competing interests
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