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Bridging the gap between guidelines and clinical practice: Physician management patterns of postherpetic neuralgia in the Tabuk region, Saudi Arabia

Hassan A. Moria[1†*], Mishari Mohammad Beragdar[2†], Amirah M. Alatawi[3], Bander Yaser Alaqeel[1], Abdullah Abdulrahman A. Alharbi[1], Raghad Salman K. Alamri[1], and Abdulmohsen Ahmed Alfarshoti[1]

[1]Department of Surgery, Faculty of Medicine, University of Tabuk, Tabuk, Saudi Arabia

[2]Department of Surgery, Faculty of Medicine, Al-Baha University, Al-Baha, Saudi Arabia

[3]Department of Family and Community Medicine, Faculty of Medicine, University of Tabuk, Tabuk, Saudi Arabia

[†]*These authors contributed equally to this work.*

***Corresponding author:**
Hassan A. Moria
(hmoria@ut.edu.sa)

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Abstract

Introduction: Postherpetic neuralgia (PHN) is a chronic neuropathic pain condition following herpes zoster. Despite established guidelines, real-world management patterns remain poorly defined in Saudi Arabia.

Objective: To assess physician involvement, treatment practices, and perceived barriers in PHN management in the Tabuk region.

Methods: A cross-sectional survey was conducted among 113 physicians from multiple specialties. The questionnaire evaluated clinical involvement, use of pharmacologic and topical therapies, referral patterns, and psychosocial assessment practices. Descriptive statistics and categorical tests were applied.

Results: Only 36.3% of physicians reported routine involvement in PHN care, with significant variation across specialties ($p < 0.001$). Participation was highest among pain/palliative specialists (85.7%), neurologists (66.7%), and dermatologists (47.1%). Awareness of topical therapies was high (92.9%), but clinical use was lower (68.3%). Gabapentinoids (87.8%), tricyclic antidepressants (73.2%), and opioids (63.4%) were commonly prescribed. Key barriers included inefficient referral systems (70.7%), limited access to interventional procedures (68.3%), and lack of standardized protocols (61.0%). Although 95.1% recognized PHN's quality-of-life impact, only 39.0% routinely assessed psychosocial burden.

Conclusions: PHN management in Tabuk shows limited physician involvement and systemic barriers. Despite high awareness of guidelines, implementation gaps persist, particularly in the use of topical therapy and psychosocial care. Strengthening referral systems and multidisciplinary approaches may improve care delivery.

Keywords: Postherpetic neuralgia; Herpes zoster; Neuropathic pain; Physician practice patterns; Referral systems; Pain management

1. Introduction

Postherpetic neuralgia (PHN) is the most common chronic complication of herpes zoster (HZ) and is characterized by persistent neuropathic pain that continues after resolution of the acute rash.[1,2] Patients commonly experience burning, stabbing, or electric shock-like pain accompanied by sensory abnormalities such as allodynia and hyperalgesia.[3] These symptoms can substantially impair sleep, physical functioning, and psychological well-being, contributing to impaired quality of life and increased healthcare burden.[4-6]

Herpes zoster results from reactivation of latent varicella-zoster virus (VZV) and remains a common infection worldwide.[7] The lifetime risk of HZ is estimated to approach one in three individuals, with annual incidence rates ranging from 3 to 5 cases per 1,000 person-years in the general population.[7,8] Among patients who develop HZ, the proportion progressing to PHN varies considerably depending on the diagnostic criteria used.[9,10] Variability in diagnostic thresholds and outcome definitions has contributed to differences in epidemiological estimates across studies.[9-11]

The pathophysiology of PHN involves complex interactions between peripheral nerve injury and central sensitization. Reactivation of VZV within dorsal root ganglia may result in neuronal injury and abnormal nociceptive signaling, contributing to persistent neuropathic pain.[12] In addition, central sensitization mechanisms characterized by increased excitability of spinal dorsal horn neurons and maladaptive neural plasticity may further amplify and sustain pain perception even after resolution of the initial viral insult.[13]

Current evidence-based recommendations support a multimodal approach to PHN management.[14-16] First-line pharmacological therapies include gabapentinoids, tricyclic antidepressants, and topical agents such as lidocaine 5% and capsaicin 8% patches.[15,16] Gabapentinoids reduce neurotransmitter release through modulation of voltage-gated calcium channels, whereas tricyclic antidepressants inhibit norepinephrine and serotonin reuptake.[17,18] Topical therapies provide localized analgesia with limited systemic exposure, making them particularly suitable for older adults and for patients with multiple comorbidities or polypharmacy.[19,20] In clinical practice, procedural strategies may be used to improve tolerability and facilitate the successful administration of high-concentration capsaicin patches.[21]

Despite the availability of evidence-based international recommendations, PHN management frequently differs from recommended practice across healthcare settings. Reported barriers include inconsistent prescribing practices, fragmented referral pathways, and variability in access to specialized pain management services.[22-26] In selected patients with severe or refractory symptoms, opioid analgesics[27,28] and interventional pain procedures[29,30] may be considered; however, concerns regarding long-term safety, opioid-related adverse effects, treatment accessibility, and variability in clinical practice remain important challenges. Non-pharmacological approaches, including cognitive–behavioral therapy (CBT), physical therapy, and multidisciplinary pain management strategies, may contribute to improved functional outcomes and quality of life in patients with chronic neuropathic pain.[31-33] In addition, comprehensive pain management strategies for HZ and PHN, including pharmacologic and supportive interventions, have been described previously.[34]

Although international literature has described pharmacological and multidisciplinary approaches to PHN management, evidence regarding physician practice patterns remains limited, particularly in Saudi Arabia. Few studies have examined how physicians across specialties implement guideline-based PHN management in routine clinical practice or how healthcare system factors influence treatment delivery. Understanding physician practice patterns may help identify implementation gaps and inform strategies to improve multidisciplinary PHN care. Therefore, this study aimed to assess physician involvement, treatment practices, referral behaviors, psychosocial assessment practices, and perceived barriers related to PHN management in the Tabuk region of Saudi Arabia.

2. Methods

2.1. Study design and setting

This study employed a cross-sectional questionnaire-based design conducted among physicians practicing in the Tabuk region of Saudi Arabia.

2.2. Participants

A convenience sampling approach was employed because no centralized registry of physicians involved in PHN management exists in the region. Eligible physicians were therefore recruited through departmental distribution, professional networks, and direct contact within participating healthcare institutions.

Participants were drawn from multiple specialties, including family medicine, internal medicine, dermatology, neurology, oncology, and pain medicine/palliative care. These specialties were selected because physicians practicing in these fields frequently encounter patients with HZ or neuropathic pain conditions and are therefore likely to be involved in the diagnosis, management, or

referral of patients with PHN.

Inclusion criteria were as follows:

- Licensed physicians providing clinical care in the Tabuk region.
- Physicians practicing in public or private healthcare settings.
- Physicians from predefined specialties relevant to PHN care.

Exclusion criteria were as follows:

- Physicians not engaged in clinical practice.
- Physicians practicing outside the Tabuk region.
- Incomplete questionnaires prevent the determination of the primary outcome.

2.3. Survey instrument

A structured questionnaire was developed following a review of the literature and relevant recommendations related to PHN management.[14,15,28,35] Questionnaire domains were informed by published literature and existing PHN management recommendations. The survey was designed to assess physician involvement in PHN management, awareness, and use of topical therapies, pharmacological prescribing practices, referral behaviors, psychosocial assessment practices, and perceived barriers to PHN care. The questionnaire consisted of multiple-choice and Likert-type response items.

The questionnaire underwent pilot testing with three physicians experienced in neuropathic pain management to evaluate clarity, wording, and appropriateness of response options. Minor revisions were implemented following pilot feedback to improve clarity and reduce potential ambiguity in selected survey items. Because the questionnaire was intended for descriptive, exploratory assessment of physician practice patterns rather than for psychometric scale development, formal validity and reliability testing were not conducted.

For the purposes of this study, "routine involvement in PHN management" was defined as regularly diagnosing postherpetic neuralgia, initiating treatment, adjusting pharmacological therapy, or coordinating referrals for patients with PHN as part of routine clinical practice.

The complete questionnaire used in the study is provided in the **Appendix**.

2.4. Data collection

The questionnaire was distributed using both electronic and paper-based formats to maximize accessibility across different healthcare settings. The electronic version was administered through Google Forms, while identical paper questionnaires were distributed in clinical departments where electronic access was limited. The structure, wording, and response options were identical across both formats to ensure consistent data collection.

Completed responses from both formats were subsequently consolidated into a single database for analysis. Data collection was conducted over a three-month period (March to April 2025). Participation was voluntary, and all responses were collected anonymously to ensure confidentiality.

Completion of the questionnaire was considered as implied consent to participate in the study.

2.5. Ethical approval

The study was approved by the Institutional Review Board of the University of Tabuk (Approval No. UT-650407-2025) and conducted in accordance with the Declaration of Helsinki.

2.6. Statistical analysis

Data were analyzed using IBM SPSS Statistics for Windows, version 28.0 (IBM Corp., United States of America). Categorical variables were summarized as frequencies and percentages, with corresponding 95% confidence intervals (CIs) where appropriate. CIs for proportions were calculated using the exact binomial (Clopper–Pearson) method.[36] Associations between physician characteristics and routine involvement in PHN management were examined using the chi-square test or Fisher's exact test, as appropriate. Where paired categorical comparisons were applicable, the McNemar test was used.[37]

Subgroup analyses were considered exploratory, and no formal adjustment for multiple comparisons was performed. Therefore, these findings should be interpreted cautiously due to the potential for type I error. All statistical tests were two-sided, and p-values < 0.05 were considered statistically significant. Reporting of this observational cross-sectional study was guided by the Strengthening the Reporting of Observational Studies in Epidemiology recommendations.[38]

3. Results

3.1. Participant demographics and professional characteristics

A total of 113 physicians participated in the survey. Table 1 summarizes the demographic and professional characteristics of the respondents. The largest proportion of participants was aged 25–30 years (38.9%), followed by 31–35 years (31.9%), with smaller proportions in older age categories. The study population was predominantly male

(69.0%) and predominantly Saudi nationals (76.1%).

Regarding professional rank, residents constituted the largest group (38.1%), followed by consultants or subspecialty consultants (26.5%), registrars (19.5%), and senior registrars (15.9%). Most respondents were employed in the public healthcare sector (81.4%), whereas 18.6% practiced in private healthcare settings.

Regarding medical specialties, family medicine represented the largest proportion of respondents (38.1%), followed by internal medicine (23.0%), dermatology (15.0%), neurology (13.3%), pain medicine or palliative care (6.2%), and oncology (4.4%). This distribution reflects the range of specialties likely to encounter patients with PHN in routine clinical practice.

Table 1. Participant demographics and professional characteristics (n = 113)

Characteristic	Category	*n*	%
Age group	25–30 years	44	38.9
	31–35 years	36	31.9
	36–40 years	18	15.9
	41–45 years	9	8.0
	≥46 years	6	5.3
Gender	Male	78	69.0
	Female	35	31.0
Nationality	Saudi	86	76.1
	Non-Saudi	27	23.9
Professional rank	Resident	43	38.1
	Registrar	22	19.5
	Senior registrar	18	15.9
	Consultant/subspecialty consultant	30	26.5
Healthcare sector	Public	92	81.4
	Private	21	18.6
Medical specialty	Family medicine	43	38.1
	Internal medicine	26	23.0
	Dermatology	17	15.0
	Neurology	15	13.3
	Pain medicine/palliative care	7	6.2
	Oncology	5	4.4

3.2. Routine involvement in postherpetic neuralgia management

Forty-one of 113 physicians (36.3%; 95% CI: 27.5–45.9) reported routine involvement in PHN management (Table 2). Routine involvement varied significantly across medical specialties (Fisher's exact test, $p < 0.001$). The highest involvement rate was observed among pain medicine or palliative care specialists (85.7%, 6/7), followed by neurologists (66.7%, 10/15) and dermatologists (47.1%, 8/17). In contrast, lower involvement rates were reported among family physicians (20.9%, 9/43) and internists (23.1%, 6/26), while 40.0% (2/5) of oncologists reported routine involvement.

Routine involvement also differed between healthcare sectors. Physicians practicing in the private sector reported greater involvement (52.4%, 11/21) than those in the public sector (32.6%, 30/92), although this difference did not reach statistical significance ($\chi^2 = 3.12$, $p = 0.08$). No statistically significant associations were identified between routine PHN involvement and age group ($p = 0.42$), gender ($p = 0.55$), nationality ($p = 0.67$), or professional rank ($p = 0.31$).

Variation in routine PHN involvement across specialties is illustrated in Figure 1.

3.3. Awareness and use of topical therapies

Physicians' awareness of topical therapies was generally high (Table 3). Analyses of treatment use were restricted to physicians who reported routine involvement in PHN management (n = 41). Capsaicin 8% patches were recognized by 77.9% of physicians (88/113; 95% CI: 69.1–85.1), while lidocaine 5% patches were recognized by 92.9% (105/113; 95% CI: 86.4–96.9). Overall, 92.9% of physicians (105/113; 95% CI: 86.4–96.9) reported awareness of at least one topical therapy.

Among physicians routinely managing PHN, the reported clinical use of topical therapies was lower than overall awareness. Capsaicin 8% patches were used by 53.7% (22/41; 95% CI: 37.4–69.3), whereas lidocaine 5% patches were used by 68.3% (28/41; 95% CI: 51.9–81.9). Overall, 68.3% (28/41; 95% CI: 51.9–81.9) reported using at least one topical therapy in clinical practice.

These findings suggest an awareness-to-implementation gap in the use of topical therapies, particularly capsaicin patches. The discrepancy between physician awareness and reported clinical use is illustrated in Figure 2.

3.4. Pharmacological and adjunctive treatment practices

Among physicians routinely managing PHN (n

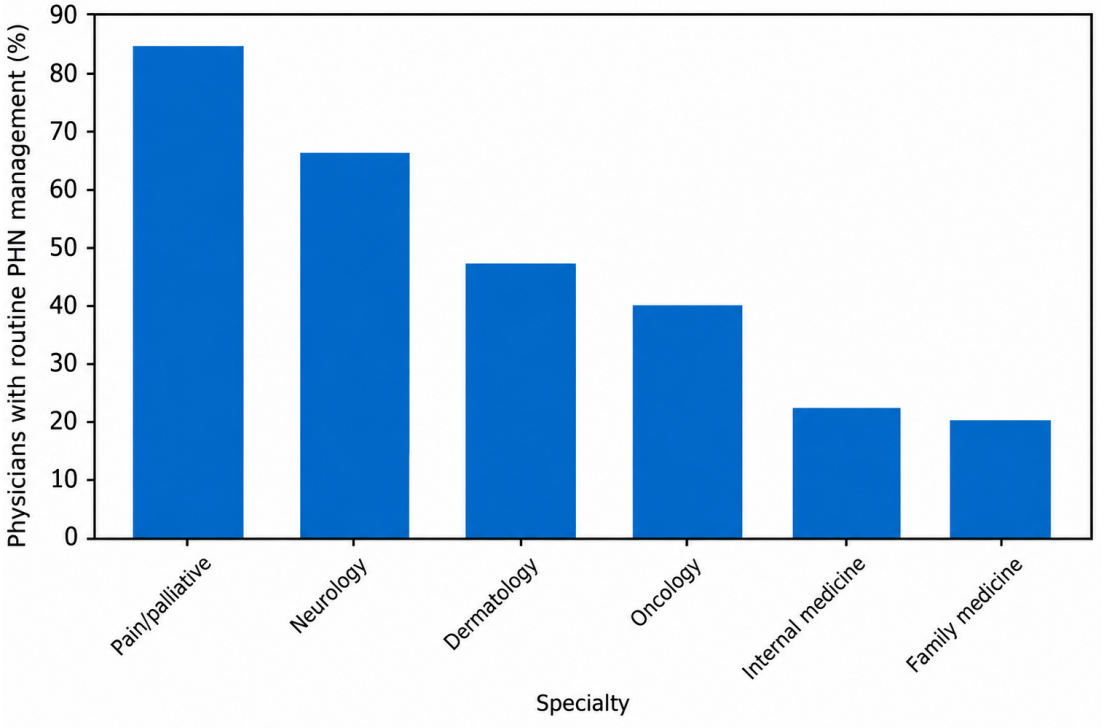


Figure 1. Routine involvement in postherpetic neuralgia (PHN) management by medical specialty

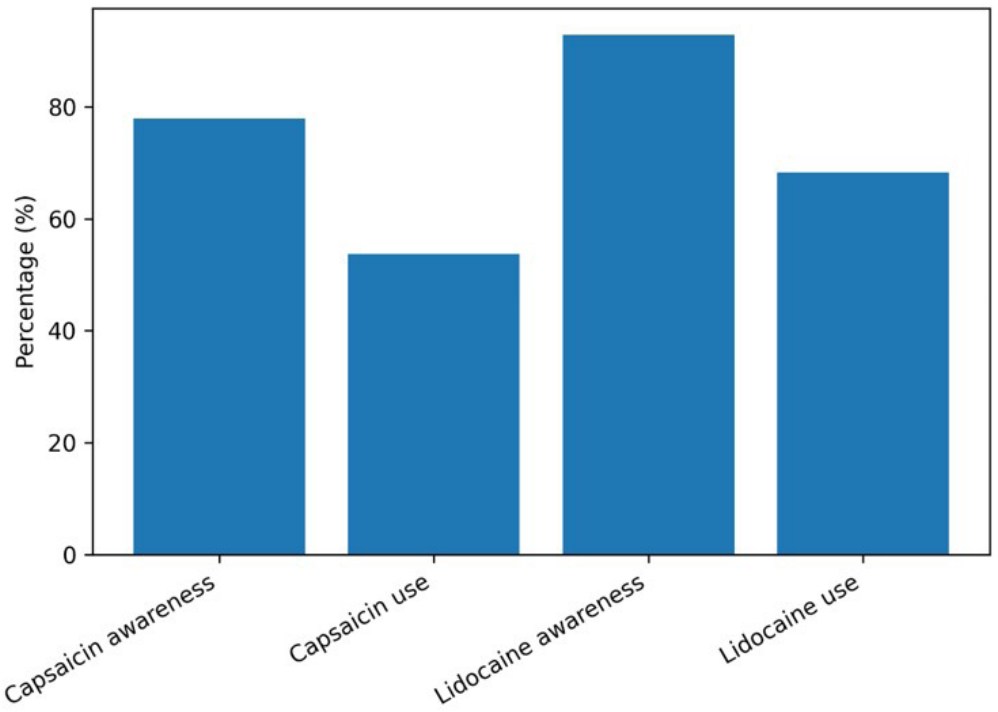


Figure 2. Awareness and clinical use of topical therapies among physicians

Table 2. Routine involvement in postherpetic neuralgia management by the healthcare sector and medical specialty (*n* = 113)

Characteristic	Category	Total (*n*)	Routinely involved (*n*)	%	95% CI
Overall		113	41	36.3	27.5–45.9
Healthcare sector	Public	92	30	32.6	23.3–43.2
	Private	21	11	52.4	30.3–73.8
Medical specialty	Pain medicine/palliative care	7	6	85.7	42.1–99.6
	Neurology	15	10	66.7	38.4–88.2
	Dermatology	17	8	47.1	23.0–72.2
	Oncology	5	2	40.0	5.3–85.3
	Internal medicine	26	6	23.1	9.0–43.6
	Family medicine	43	9	20.9	10.0–36.0

Table 3. Awareness and use of topical therapies

Topical therapy	Awareness (*n* = 113), *n* (%)	95% CI	Use among physicians routinely managing PHN (*n* = 41), *n* (%)	95% CI
Capsaicin 8% patches	88 (77.9%)	69.1–85.1	22 (53.7%)	37.4–69.3
Lidocaine 5% patches	105 (92.9%)	86.4–96.9	28 (68.3%)	51.9–81.9
At least one topical therapy	105 (92.9%)	86.4–96.9	28 (68.3%)	51.9–81.9

Abbreviations: CI: Confidence interval; PHN: Postherpetic neuralgia.

= 41), gabapentinoids were the most frequently prescribed agents (87.8%, 36/41), followed by tricyclic antidepressants (73.2%, 30/41). Other commonly reported pharmacological treatments included opioids (63.4%, 26/41) and serotonin–norepinephrine reuptake inhibitors (48.8%, 20/41). Detailed pharmacological and adjunctive treatment practices are presented in Table 4.

Adjunctive pharmacological therapies were also frequently reported. Nonsteroidal anti-inflammatory drugs (NSAIDs) were prescribed by 56.1% of physicians, vitamin B12 injections by 46.3%, and vitamin B-complex supplementation by 41.5%.

In addition to pharmacological therapies, non-pharmacological adjunctive interventions were widely reported. Approximately 78.0% of physicians indicated using at least one non-pharmacological modality, including physical therapy, CBT, acupuncture, or interventional pain procedures.

3.5. Perceived barriers to optimal postherpetic neuralgia care

Barrier analysis included only physicians who reported routine involvement in PHN management (*n* = 41). System-level barriers were the most frequently reported obstacles to optimal PHN care. The most commonly reported barriers were inefficient referral systems (70.7%), limited access to interventional procedures (68.3%), absence of standardized treatment protocols (61.0%), and limited access to pain specialists (58.5%).

Medication-related barriers included limited medication availability (51.2%) and prescribing restrictions (46.3%). Patient-related barriers were reported less frequently and included rejection of topical therapy (34.1%), concerns about treatment adherence (29.3%), and

medication cost (24.4%).

The distribution of physician-reported barriers to PHN care is summarized in Figure 3 and Table 5.

Statistical analyses demonstrated consistent patterns across the study findings. While descriptive estimates indicated variability in physician involvement, treatment practices, and perceived barriers, formal statistical comparisons confirmed significant differences across medical specialties (Fisher's exact test, $p < 0.001$) but not across several demographic or professional characteristics. CIs for several estimates were wider in smaller specialty

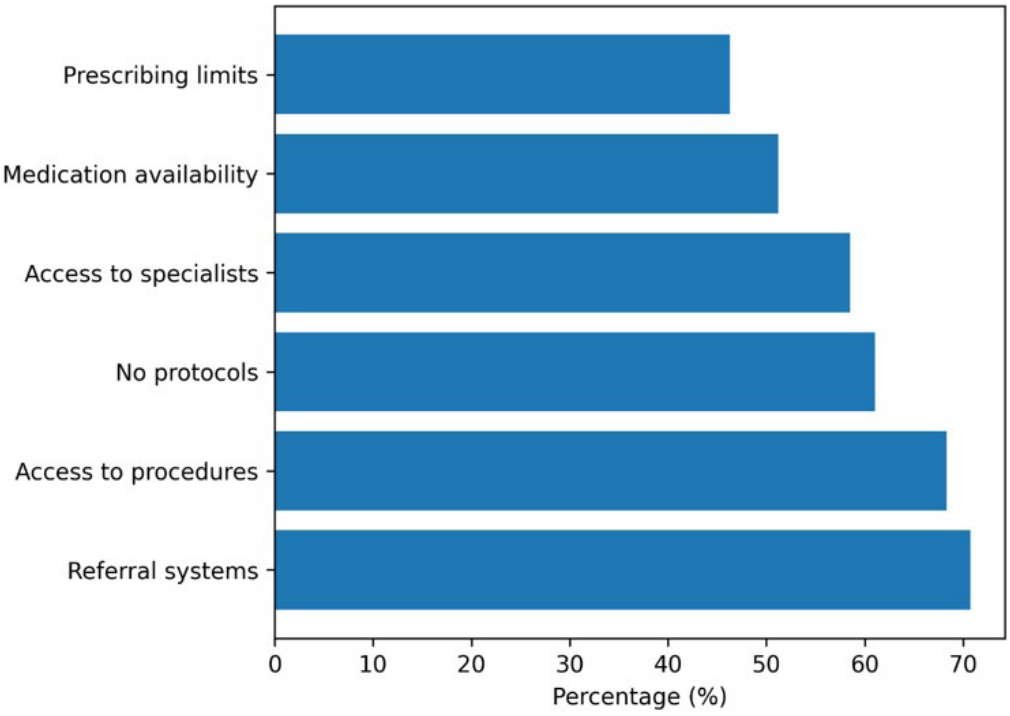


Figure 3. Physician-reported barriers to optimal postherpetic neuralgia care

Table 4. Pharmacological and adjunctive treatment practices among physicians routinely managing postherpetic neuralgia (*n* = 41)

Treatment category	Medication/treatment	*n*	%	95% CI
Guideline-recommended first-line therapies	Gabapentinoids (gabapentin, pregabalin)	36	87.8	73.8–95.9
	Tricyclic antidepressants (amitriptyline, nortriptyline)	30	73.2	57.1–85.8
Second-line/alternative neuropathic agents	SNRIs (duloxetine, venlafaxine)	20	48.8	32.9–64.9
Analgesics used in practice	Opioids (tramadol, oxycodone, morphine)	26	63.4	46.9–77.9
Adjunctive pharmacologic treatments	NSAIDs	23	56.1	39.7–71.5
	Vitamin B12 injections	19	46.3	30.7–62.6
	Vitamin B-complex supplementation	17	41.5	26.3–57.9
Non-pharmacological adjunctive treatments	Physical therapy, CBT, acupuncture, or interventional procedures	32	78.0	62.4–89.4

Abbreviations: CBT: Cognitive–behavioral therapy; CI: Confidence interval; NSAIDs: Nonsteroidal anti-inflammatory drugs; SNRIs: Serotonin–norepinephrine reuptake inhibitors.

Table 5. Perceived barriers to postherpetic neuralgia care (*n* = 41)

Barriers	*n*	%	95% confidence interval
Inefficient referral systems	29	70.7	54.5–83.9
Limited access to interventional procedures	28	68.3	51.9–81.9
Absence of standardized protocols	25	61.0	44.5–75.8
Limited access to pain specialists	24	58.5	42.1–73.7
Geographic distance to specialized centers	18	43.9	28.5–60.3
Limited medication availability	21	51.2	35.1–67.1
Prescribing restrictions	19	46.3	30.7–62.6
Underuse of topical therapy	16	39.0	24.2–55.5
Patient rejection of topical therapy	14	34.1	20.1–50.6
Adherence concerns	12	29.3	16.1–45.5
Cost concerns	10	24.4	12.4–40.3

subgroups, reflecting reduced precision associated with limited sample sizes.

4. Discussion

This cross-sectional study evaluated physician practice patterns, treatment approaches, and perceived barriers related to PHN management in the Tabuk region. Several important findings emerged. First, routine physician involvement in PHN management was limited, with only about one-third of respondents reporting active participation in PHN care. Second, PHN management appeared to be concentrated among a limited number of specialties, particularly pain medicine/palliative care, neurology, and dermatology. Third, although awareness of guideline-recommended therapies—especially topical treatments—was high, reported clinical use was substantially lower. Finally, major barriers to PHN care were predominantly system-level, while psychosocial assessment remained relatively uncommon despite widespread recognition of PHN's impact on quality of life. Collectively, these findings suggest that gaps in PHN management may reflect both variability in physician practice patterns and broader healthcare system challenges.

Only 36.3% of surveyed physicians (41/113; 95% CI: 27.5–45.9) reported routine involvement in PHN management. This relatively limited level of engagement suggests that many physicians who may encounter PHN patients in routine clinical practice—particularly in primary care and general internal medicine—are not regularly involved in managing the condition. Given the burden of HZ and the risk of persistent neuropathic pain, limited physician involvement may be associated with delays in recognition, treatment initiation, and escalation of care.[3-5] The relatively low participation of family physicians and internists is notable because these specialties frequently represent the first point of contact for patients presenting with chronic pain symptoms.

Routine involvement in PHN management varied significantly across specialties (Fisher's exact test, $p < 0.001$), with the highest involvement rates observed among pain medicine or palliative care specialists (85.7%; 95% CI: 42.1–99.6), followed by neurologists (66.7%; 95% CI: 38.4–88.2) and dermatologists (47.1%; 95% CI: 23.0–72.2). In contrast, substantially lower involvement was reported among family physicians (20.9%; 95% CI: 10.0–36.0) and internists (23.1%; 95% CI: 9.0–43.6). These findings indicate that PHN care remains concentrated within a limited number of specialty groups. Strengthening the role of primary care physicians in PHN management may improve early recognition, facilitate guideline-based treatment initiation, and enhance continuity of care.[14-16]

Differences by healthcare sector were descriptive only. Physicians practicing in private settings reported more frequent routine involvement in PHN management than those practicing in public institutions (52.4% versus 32.6%); however, this difference was not statistically significant ($\chi^2 = 3.12$, $p = 0.08$). Given the small number of private-sector respondents, this finding should be interpreted cautiously and should not be considered evidence of a true sector-

level difference.

An important observation in this study was the discrepancy between awareness and reported clinical use of topical therapies. Overall awareness of at least one topical therapy was reported by 92.9% of physicians (95% CI: 86.4–96.9). Recognition of lidocaine 5% patches was particularly high (92.9%; 95% CI: 86.4–96.9), whereas capsaicin 8% patches were recognized by 77.9% (95% CI: 69.1–85.1) of respondents. Among physicians routinely involved in PHN management, reported clinical use was substantially lower. Lidocaine patches were used by 68.3% (95% CI: 51.9–81.9), whereas capsaicin patches were used by 53.7% (95% CI: 37.4–69.3). Overall, only 68.3% (95% CI: 51.9–81.9) reported using at least one topical therapy in routine practice. These findings may reflect an awareness-to-implementation gap, indicating that knowledge of guideline-supported therapies does not consistently translate into routine clinical use. Potential contributing factors may include medication availability, cost considerations, and logistical challenges associated with capsaicin patch application in outpatient settings.[19,20]

Evidence from clinical studies indicates that high-concentration capsaicin patches can provide clinically meaningful analgesic benefit in PHN when appropriately administered.[21] Because topical therapies provide localized analgesia with limited systemic exposure, improving access to these therapies may support more individualized treatment strategies, particularly among older patients and those at risk of medication-related adverse effects.

Gabapentinoids were the most frequently reported medications (87.8%; 95% CI: 73.8–95.9), followed by tricyclic antidepressants (73.2%; 95% CI: 57.1–85.8). This prescribing pattern is generally consistent with current recommendations identifying these agents as first-line pharmacological therapies for PHN.[14-16] However, opioids were reported by 63.4% of physicians (95% CI: 46.9–77.9), suggesting that these agents remain commonly used despite recommendations advocating cautious and selective use because of concerns regarding long-term safety and opioid-related adverse effects.[27,28]

Adjunctive pharmacological therapies were also frequently reported. NSAIDs were prescribed by 56.1% (95% CI: 39.7–71.5) of physicians, vitamin B12 injections by 46.3% (95% CI: 30.7–62.6), and vitamin B-complex supplementation by 41.5% (95% CI: 26.3–57.9). In addition, non-pharmacological interventions—including physical therapy, CBT, acupuncture, and interventional pain procedures—were reported by 78.0% (95% CI: 62.4–89.4) of physicians managing PHN. Although these approaches are used in clinical practice, the supporting evidence varies across interventions and remains less established than that for first-line neuropathic pain medications.[31-33]

System-level barriers were consistently highlighted by respondents. The most frequently identified obstacles included inefficient referral systems (70.7%; 95% CI: 54.5–83.9), limited access to interventional procedures (68.3%; 95% CI: 51.9–81.9), absence of standardized treatment protocols (61.0%; 95% CI: 44.5–75.8), and limited access to pain specialists (58.5%; 95% CI: 42.1–73.7). These findings suggest that healthcare system factors substantially influence PHN management practices. Delayed referral pathways may reduce opportunities for timely specialist evaluation, whereas the absence of standardized clinical pathways may increase variability in treatment decisions across healthcare settings.

Improving access to specialized pain services—including interventional pain management where appropriate—may help address some of these barriers. Interventional techniques such as nerve blocks and neuromodulation have been explored as treatment options for refractory PHN.[29,30,39]

Another important observation was the discrepancy between recognition of PHN's impact on quality of life and routine psychosocial assessment. Although most physicians acknowledged the burden of PHN on patient well-being, only a minority reported consistently incorporating psychosocial assessment into routine clinical practice. Given the relationship between chronic neuropathic pain and psychological distress, limited psychosocial assessment may reduce opportunities for comprehensive patient-centered management.[31,32]

Non-pharmacological approaches—including CBT, physical therapy, and multidisciplinary pain management strategies—may contribute to improved functional outcomes and quality of life in patients living with chronic neuropathic pain.[31-33] However, implementation of these approaches often depends on the availability of multidisciplinary services and referral pathways.

The composite measure of integrated holistic care was achieved by fewer than half of physicians routinely managing PHN, further highlighting the limited integration of biopsychosocial pain management approaches in routine practice. Time constraints, limited familiarity with psychosocial assessment tools, competing clinical priorities, and restricted access to mental health services may contribute to this gap. Incorporating brief psychosocial assessment tools into routine workflows and strengthening referral pathways for psychological support may help improve comprehensive PHN management.

The findings of this study are consistent with previous international literature reporting variability in neuropathic

pain management practices and implementation of multidisciplinary care across healthcare settings.[22-26,31-33,40] Previous studies have similarly identified gaps between guideline awareness and routine clinical implementation, particularly regarding topical therapies, psychosocial assessment, and multidisciplinary pain management strategies. Collectively, these findings suggest that challenges in neuropathic pain care may reflect broader healthcare system, referral, and implementation factors rather than physician knowledge alone.

Because patients with HZ and persistent neuropathic pain frequently first present in primary care settings, strengthening the involvement of non-specialist physicians may facilitate earlier recognition and treatment of PHN. Targeted educational initiatives, simplified treatment algorithms, and improved referral coordination may further support earlier treatment initiation and reduce delays in access to specialist pain services.

5. Implications for practice and policy

The findings of this study have several implications for clinical practice and healthcare policy. Improving access to specialized pain services—including interventional pain management where appropriate—may help reduce delays in treatment escalation for patients with refractory PHN. Expanding multidisciplinary pain clinics and strengthening referral coordination between primary care and specialist services may further support integrated care delivery.

Psychosocial assessment should also be more systematically incorporated into PHN management. Routine screening for depression, anxiety, and pain-related psychological distress using brief validated assessment tools may facilitate earlier identification of psychosocial burden and support a more comprehensive biopsychosocial approach to chronic pain care.[31-33]

Enhancing physician education regarding neuropathic pain management may help address observed gaps in care. Educational initiatives focused on PHN diagnosis, pharmacological treatment strategies, and appropriate use of topical therapies may improve physician confidence in managing these patients, particularly among primary care physicians. Strengthening collaboration between primary care providers, neurologists, dermatologists, and pain specialists may also support a more coordinated multidisciplinary approach to PHN management.

6. Strengths and limitations

This study provides regional evidence regarding physician involvement, treatment practices, referral behaviors, and perceived barriers related to PHN management. Inclusion of physicians from multiple specialties and from both public and private healthcare sectors enhances the relevance of the findings to routine clinical practice. In addition, the use of a structured, pilot-tested questionnaire ensured consistent data collection across respondents.

Several limitations should be considered when interpreting these findings. The cross-sectional design precludes causal inference and does not capture potential changes in physician practices over time. Use of convenience sampling may introduce selection bias and limit the representativeness of the study population. Because the analysis relied on self-reported practice patterns, responses may also have been influenced by recall bias or social desirability bias.

The study was conducted within a single geographic region, which may limit generalizability to other healthcare settings. Although the overall sample size was reasonable, only 41 physicians reported routine involvement in PHN management, reducing the precision of subgroup analyses and contributing to wider CIs in some estimates. In addition, the study did not include objective prescribing data, referral records, or patient outcome measures, preventing direct evaluation of the relationship between reported practices and clinical outcomes.

Although residents were the largest individual subgroup of respondents, physicians at registrar level or higher accounted for 61.9% of the study population, indicating that most respondents had progressed beyond entry-level clinical training.

Future research should include multi-regional samples, incorporate objective indicators of clinical practice where feasible, and evaluate whether improvements in referral pathways, standardized treatment protocols, and psychosocial assessment translate into measurable improvements in patient outcomes.

7. Conclusion

Physician involvement in PHN management in the Tabuk region appears limited and unevenly distributed across medical specialties, suggesting that PHN care remains concentrated among a relatively small group of clinicians. Although awareness of recommended therapies was generally high, implementation in routine clinical practice remained inconsistent.

System-level barriers—including inefficient referral pathways, limited access to specialized pain services, and absence of standardized treatment protocols—may contribute to important gaps in PHN care. Psychosocial assessment was also infrequently incorporated into routine practice despite widespread recognition of PHN's

substantial impact on quality of life.

Addressing these gaps will likely require strengthening primary care engagement, improving referral coordination, expanding access to specialist pain services, and promoting a more integrated biopsychosocial approach to PHN management.

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Conflict of interest

The authors declare no conflicts of interest.

Author contributions

Conceptualization: Hassan A. Moria, Amirah M. Alatawi
Data curation: Bander Yaser Alaqeel, Abdullah Abdulrahman A. Alharbi
Formal analysis: Hassan A. Moria, Mishari Mohammad Beragdar
Investigation: Bander Yaser Alaqeel, Abdullah Abdulrahman A. Alharbi, Raghad Salman K. Alamri, Abdulmohsen Ahmed Alfarshoti
Methodology: Hassan A. Moria, Mishari Mohammad Beragdar, Amirah M. Alatawi
Project administration: Hassan A. Moria
Supervision: Hassan A. Moria, Amirah M. Alatawi
Writing–original draft: Hassan A. Moria
Writing–review & editing: Hassan A. Moria, Mishari Mohammad Beragdar, Amirah M. Alatawi
All authors read and approved the final manuscript.

Ethics approval and consent to participate

The study was approved by the Institutional Review Board of the University of Tabuk (Approval No. UT-650407-2025) and conducted in accordance with the Declaration of Helsinki. All participants were informed about the purpose of the study, and informed consent was obtained electronically from all participants prior to participation in the survey.

Consent for publication

All participants provided informed consent for their anonymized responses to be used for research and publication purposes prior to participation in the study.

Availability of data

All data generated or analyzed during this study are included in this published manuscript.

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Appendix

Questionnaire: Bridging the gap between guidelines and clinical practice: Physician management patterns of postherpetic neuralgia in Saudi Arabia

Section 1: Participant information

1. Age group

Please select your age group.

- 25–30 years
- 31–35 years
- 36–40 years
- 41–45 years
- ≥ 50 years

2. Gender

- Male
- Female

3. Nationality

- Saudi
- Non-Saudi

4. Professional rank

- Resident
- Registrar
- Senior registrar
- Consultant/subspecialty consultant

5. Healthcare sector

- Public healthcare sector
- Private healthcare sector

6. Medical specialty

- Family medicine
- Internal medicine
- Dermatology
- Neurology
- Pain medicine/palliative care
- Oncology
- Other (please specify)

Section 2: Routine involvement in PHN management

7. Are you routinely involved in the diagnosis or management of postherpetic neuralgia (PHN) in your clinical practice?

- Yes
- No

Section 3: Awareness of topical therapies for PHN

8. Are you aware of capsaicin 8% patches as a treatment option for PHN?

- Yes
- No

9. Are you aware of lidocaine 5% patches as a treatment option for PHN?

- Yes
- No

- No

Section 4: Clinical use of topical therapies

(Answered only by physicians who reported routine PHN management)

10. Do you use capsaicin 8% patches in the management of PHN?

- Yes

11. Do you use lidocaine 5% patches in the management of PHN?

- Yes
- No

Section 5: Pharmacological treatment practices

(Answered only by physicians who routinely manage PHN)

12. Which of the following medications do you prescribe for PHN? (Multiple answers allowed)

- Gabapentinoids (gabapentin or pregabalin)
- Tricyclic antidepressants (e.g., amitriptyline)
- Serotonin–norepinephrine reuptake inhibitors (e.g., duloxetine, venlafaxine)
- Opioid analgesics (e.g., tramadol, morphine, oxycodone)
- Nonsteroidal anti-inflammatory drugs (NSAIDs)
- Vitamin B12 injections
- Vitamin B-complex supplementation

Section 6: Non-pharmacological treatment practices

13. Do you use any non-pharmacological or adjunctive interventions for PHN?

(Multiple answers allowed)

- Physical therapy
- Cognitive behavioral therapy (CBT)
- Acupuncture
- Interventional pain procedures
- None

Section 7: Barriers to optimal PHN management

(Answered only by physicians who routinely manage PHN)

14. Which of the following barriers affects PHN management in your clinical setting?

(Multiple answers allowed)

System-related barriers

- Inefficient referral systems
- Limited access to interventional procedures
- Absence of standardized treatment protocols
- Limited access to pain specialists
- Geographic distance to specialized pain centers

Medication-related barriers

- Limited medication availability
- Prescribing restrictions

Patient-related barriers

- Underuse or rejection of topical therapy
- Concerns about patient adherence
- Medication cost