JPSIM Journal of Pakistan Society of Internal Medicine

Original Article

Knowledge, Attitudes, and Screening Practices for Diabetic Neuropathy Among General Practitioners: A Cross-Sectional Study in Pakistan

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Abstract

Objective: To assess the knowledge, attitudes, and screening practices of general practitioners (GPs) regarding diabetic neuropathy and identify barriers to guideline implementation in primary care settings.

Methods: This cross-sectional survey was conducted from June to December 2024 across Pakistan's public and private outpatient services. A total of 100 licensed GPs involved in diabetic patient care participated in the survey. Data were collected using a validated structured questionnaire and analyzed by using SPSS version 25. Responses were reported as frequencies and associations were calculated using a chi-square test with $p < 0.05$ taken as significant.

Results: Out of 100 participants, 56 scored in the Poor/Fair category, 36 scored Moderate, and only 8 scored Good in the knowledge domain. Routine screening was reported by 46% of respondents; most relied on history and physical examination rather than standardized tools. A significant association was found between screening practices and any formal training ($p = 0.002$), but not with age or duration of clinical practice.

Conclusion: The findings of this study show the gaps in the knowledge and screening practices of GPs. Routine screening reported by less than 50% of the participants, reliance on informal methods, and inconsistent documentation raise concerns, highlighting an urgent need for targeted educational interventions and reinforcement of screening practices.

Keywords: Diabetic neuropathy, general practitioners, primary care physicians, screening practices, knowledge, diabetes complications

How to cite this:

Masud M, Bangash LR. Knowledge, Attitudes, and Screening Practices for Diabetic Neuropathy Among General Practitioners: A Cross-Sectional Study in Pakistan. J Pak Soc Intern Med. 2026;7(1): 10-14

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Received: 30-06-2025 **Revised:** 25-01-2026 **Accepted:** 17-02-2026 **DOI:** https://doi.org/10.70302/jpsim.v7i1.2603

Introduction

Diabetic neuropathy (DN) is among the common complications of diabetes mellitus (DM). Up to 50% of the long-standing cases of DM show signs of DN to a variable extent.[1,2] Patients with advanced age and those with a history of DM over 5 years are at increased risk of developing DN.[3] Early identification and management are crucial in this regard to control the long-term and permanent damage that could be debilitating for diabetic patients.[4] Despite the high prevalence and devastating consequences, DN remains an overlooked aspect of the disease spectrum. Literature shows that approximately 80% of DN cases remain undiagnosed till the disease is advanced.[5] This delay in diagnosis leads to disease progression and impairment of the quality of life of diabetic patients.[6,7]

According to the American Diabetes Association (ADA), screening for DN should be done in patients with type 2 diabetes at the time of diagnosis. For type 1 DM, it should be done five years after the diagnosis.[8] Simple and cost-effective tools and methods like a 10-g monofilament test, vibration perception with a 128Hz tuning fork, and ankle reflex examination are recommended for screening purposes.[9] However, evidence from the available literature shows that these guidelines are often not followed, particularly in the primary care provided by the non-specialists. General practitioners (GPs), who are the first-line physicians encountered by diabetics, often miss screening these patients. This may be due to a lack of awareness, training, or time constraints.[5,10]

Various surveys done across the globe highlight the gap in the screening practices, particularly among GPs. In a cross-sectional survey conducted in Turkiye, approximately 70% of primary care physicians reported that

they had never used any objective tool for screening DN. 31% among them admitted that their knowledge regarding screening protocols is poor.[11] Similarly, a survey conducted in India revealed that less than 40% of GPs had some knowledge about the screening protocols for D.[12] This knowledge gap on the part of GPs, along with limited resources and time constraints, makes the scenario much more alarming.[9]

This study, therefore, aims to investigate the knowledge, attitude, and screening practices of the GPs regarding DN and to explore the barriers they face in implementing the guidelines. Identification of these gaps is crucial for designing effective educational strategies for the GPs and the formation of local guidelines to reduce the burden of this complication.

Methods

This cross-sectional survey was conducted between June 2024 to December 2024 across various government and private sector outdoor services in Pakistan, targeting general practitioners involved in the primary care of diabetic patients.

The sample size of 100 participants was calculated using the WHO sample size calculator with a 95% confidence interval, 10% margin of error, and an estimated awareness rate of 50%. The participants included in the study were licensed general practitioners who practice in the public or private sector and routinely care for diabetic patients. Endocrinologists, diabetologists, neurologists, general practitioners with additional formal training in diabetic neuropathy, house officers, and postgraduate trainees were excluded from the study. The Institutional Review Board of Jinnah Burn & Reconstructive Surgery Centre, Lahore, issued the ethical approval letter (No. 4491/ED/JB&RSC) for the study.

A structured questionnaire was developed based on ADA screening guidelines and relevant literature. The survey had five questions related to the demographic data of the participants, five questions to check for their knowledge about DN screening (Table- 1). In the next section of the survey, questions were asked to check their screening practices, like frequency of screening, methods used for screening, documentation, and referral to specialists. Five questions were asked about the perceived barriers and their opinion about the educational need for DN screening. Content validity of the questionnaire was ensured by expert review from two endocrinologists and a public health researcher. A pilot test with 10 GPs was conducted for clarity and item comprehension. Cronbach's alpha was calculated to assess the internal consistency of the knowledge section and was found to be 0.71, indicating acceptable reliability.

The questionnaire was distributed in both paper-based and electronic formats (via Google Forms). Participants were recruited from outpatient departments of public hospitals, private clinics, and community health centers in various cities of Pakistan through CME workshops, social media platforms, and direct outreach. Participation was voluntary and anonymous, and informed consent was obtained before data collection.

Table 1: *Questions to check the knowledge of the participants about DN screening*

No.	Questions
1.	What percentage of diabetic patients develop peripheral neuropathy?
2.	Which of the following are common symptoms of diabetic neuropathy? (Select all that apply)
3.	What is the recommended timing for initiating screening for diabetic neuropathy in type 2 diabetes?
4.	Which of the following tools are recommended for screening DN in primary care? (Select all that apply)
5.	How frequently should screening for diabetic neuropathy be performed in diabetic patients?

The collected data was analyzed through the Statistical Package for Social Sciences (SPSS) version 25. Descriptive statistics were used to summarize the demographic data and frequency of responses. Knowledge scores were computed based on correct responses, ranging from 1 to 3 (Table 2). Chi-square tests were applied to explore associations between variables like years of practice, age, formal training in DM or knowledge and screening practices. A p-value <0.05 was considered statistically significant.

Results

A total of 100 general practitioners participated in this study. Respondents represented a wide range of age groups and practice settings. The demographics of the participants are shown in table 3. Out of 100, 56 participants scored 1, 36 scored 2, and only 8 scored 3 out of 3 in the knowledge scoring. 54% of the GPs do not screen for the DN. Among those who screen, findings were documented by 48% on a regular basis, 30% reported documentation occasionally, while 22% of the participants never documented the presence of DN in their patients. The most common method used for screening was history and physical examination, followed by the 10g monofilament test (Figure I). Sixty-four percent of the participants refer patients with DN for specialist care routinely, 28% occasionally, and 10% do not refer such patients. No significant association was seen between screening practices and age group of the GPs ($p=0.114$), their knowledge scores ($p=0.075$), and years

of practice (p=0.5801). However significant association was seen between any formal training in DM and screening practices (p=0.002).

Ninety percent of the participants agreed that timely screening is necessary and it helps in the prevention of developing severe morbidity in diabetics. 68% of the participants never attended any CME session on screening for DN. Key barriers to screening included lack of time, lack of training, and low patient compliance (Figure II). Despite this, more than 90% of participants expressed interest in attending future training sessions.

Table 2: *Knowledge scores according to the number of right responses*

Knowledge Score	Category	Interpretation
1	Poor/Fair	No or limited correct knowledge
2	Moderate	Reasonable awareness with minor gaps
3	Good	Complete and correct knowledge

Table 3: *Demographic data of the survey respondents*

Demographic variables	Categories	Percentages
Age range in years	<30	14
	30–39	30
	40–49	24
	≥50	32
Gender	Male	60
	Female	40
Years of experience	<5	18
	5–10	22
	>10	60
Place of practice	Government hospital	46
	private clinic	40
	Others	14
Formal training in diabetes management	Yes	14
	No	86

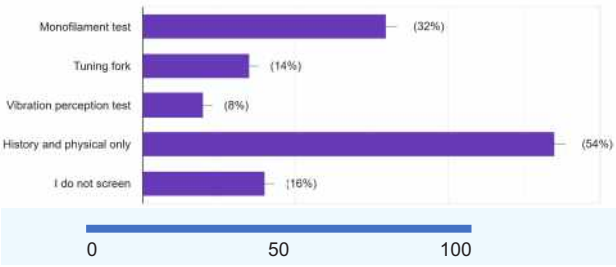

Figure I: *Screening tools used by Gps*

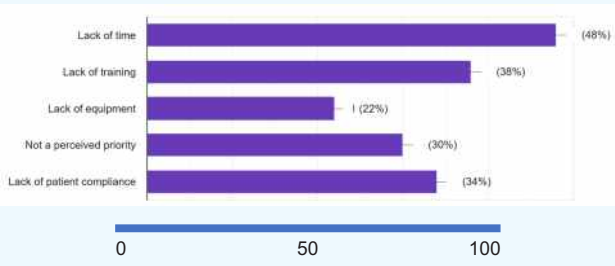

Figure II: *Key barriers for screening DN*

Discussion

The present study aimed to evaluate the knowledge and screening practices of general practitioners (GPs) regarding diabetic neuropathy (DN). Despite being a common complication.[13] the results of our study show that the overall knowledge regarding screening practices of DN among GPs is poor. Only 3% of the participants responded to all the questions related to knowledge about DN screening correctly. Our findings show an even more drastic situation than the results of a survey conducted in Denizli, Turkiye, where 31% of the primary care physicians rate their knowledge about DN as poor or very poor. In the same survey, 74.4% of participants did not use any screening test. These results are also consistent with our findings, where only 32% of participants mentioned the use of 10-g monofilament, a tool recommended for screening DN.[11] This finding is also consistent with another survey conducted in Indonesia, where more than 90% of the GPs were unfamiliar with the use of monofilament.[14] Results of another study showed that 66.5% of the primary care physicians did not utilize any specific tool for screening DN. The irony is that 39.9% indicated that they would not use any such instrument even if made available to them.[15] Although our results show that 46% of the participants screen for DN, the practice is not consistent, and the majority relied on history and basic clinical examination rather than using a recommended tool. This signifies that the risk of missing many patients with early signs of DN, as basic examination and history are not a reliable method for screening such patients.

The documentation and referral practices of GPs in our survey were also inconsistent. This is in contrast to the findings of a German survey, where 87% of the physicians report DN screening findings regularly.[10]

Interestingly, our analysis demonstrated a significant association between routine screening practice and any formal training regarding DN, but no significant association was seen between knowledge and screening practices. Firstly, this may be due to the fact that the knowledge scores were low among the majority of the participants. It also highlights the fact that knowledge may not necessarily translate into practice, and regular CMEs or workshops are needed to inculcate the scree-

ning practices among these primary care providers.[16]

Key barriers to screening of DN in our study were lack of time, inadequate training, and non-compliance of the patients. These were in contrast to the findings of Anastasi et al. where the most common barriers reported were low clinical priority and confusion regarding screening methods.[17] Zhao et al. reported limited time and limited tools as the most common barriers to DN screening.[18] Despite this, more than 90% of participants expressed interest in attending future training sessions indicating keenness on the behalf of the participants. This study had several limitations. The sample size was relatively small and based on convenience sampling, which may limit the generalizability of the findings. Data was self-reported, introducing the potential for response bias. Additionally, this study used a quantitative survey, which may limit the depth of understanding regarding attitudes and behaviors. Future studies should consider incorporating qualitative interviews or focus groups to gain more nuanced insights.

Conclusion

The findings of this study highlight the gravity of the situation. It shows the gaps in the knowledge and screening practices of primary care physicians. While routine screening was reported by a majority, reliance on informal methods and inconsistent documentation raise concerns. There is an urgent need for targeted educational interventions and reinforcement of screening practices in primary care to bottle up the genie. Only in this way, the burden of the disease can be controlled.

Acknowledgment

The authors would like to thank all the general practitioners who participated in the survey and shared their insights. AI help was sought for the grammatical correction of the manuscript.

Ethical Approval: The IRB/EC approved this study via letter no. 4491/ED/JB&RSC dated May 05, 2023.

Conflict of Interest: None

Funding Source: None

Authors' Contribution

LRB: Conception.

LRB: Design of the work.

MM, LRB: Data acquisition, analysis, or interpretation.

MM, LRB: Draft the work.

LRB: Review critically for important intellectual content.

All authors approve the version to be published.

All authors agree to be accountable for all aspects of the work.

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