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Treatment satisfaction and quality of life among neuropathic pain patients: A cross-sectional study

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Abstract

Objective: This study aimed to evaluate treatment satisfaction and quality of life in neuropathic pain patients. *Methods:* This cross-sectional study, carried out over eight months at a tertiary care hospital, employed four various tools: patient-reported demographic and clinical data, the Medication Adherence Rating Scale for adherence measurement, the Visual Analogue Scale (VAS) for evaluating pain discomfort, and the Treatment Satisfaction Questionnaire for Medication. *Results:* Among 300 participants, 264 fulfilled the inclusion criteria, with an average age of 39.27 years (± 45.25) and 62.12% being male; 50.38% were aged 56 to 75. Diabetes mellitus was the most prevalent comorbidity (32.20%), while 9.47% were obese and 26.51% were overweight. Medication usage indicated that 51.65% of patients were on a combination of pregabalin, nortriptyline, and methylcobalamin, with 11.36% on pregabalin plus nortriptyline. Adherence rates showed that 198 patients had high adherence (75%), while 66 had low adherence (25%). Quality of life assessments revealed significant impacts across SF-36(Short Form Health Survey) domains ($p < 0.001$), affecting physical functioning, emotional well-being, and social functioning. Additionally, higher treatment satisfaction scores (>50) correlated with improved overall quality of life and general health ($p = 0.039$).
Conclusion: The study highlights the importance of addressing patient-reported physical and mental challenges, as these factors are closely linked to medication adherence, treatment satisfaction, and overall quality of life. Highly satisfied patients are more likely to adhere to their medication regimen and experience an improved quality of life.

Keywords: Health-related quality of life, medication adherence, medication regimen, neuropathic pain, treatment satisfaction

INTRODUCTION

In the somatosensory nervous system, an aberrant pain pathway results in neuropathic pain (NP). There are three types of it: mixed NP, peripheral NP, and central NP. Neuropathic pain (NP) is a long-lasting condition that adversely affects a patient's quality of life (QoL), social connections, financial stability, and mental well-being. Neuropathic pain (NP) can persist for months or even years, but it does not affect everyone with sensorimotor processing issues.[1-4] However, its prevalence is significantly higher among certain groups, affecting 26% of type 2 diabetics, 21% of herpes zoster patients, and 7-8% of individuals with other conditions.[5] At its peak, 60.5% of patients were in the 50-64 age range, indicating a significant prevalence.[6] It typically affects persons who have physically demanding jobs, particularly in rural areas.[7] Due to its chronic nature, NP raise the disability index, reduce productivity, and increase medical costs.[8] Estimating global NP prevalence is difficult due to the variability of the criteria. According to the study, prevalence rates might range from 3% to 17%, depending on the community and the disease. Post-herpetic neuropathic pain occurs in 3.9 to 42 per 100,000 person-years, whereas peripheral diabetic neuropathy occurs in 15.3 to 72.3 per 100,000 person-years.[9] NP is more common in women than in men, with its prevalence reaching a peak.[10] The aforementioned variations demonstrate the intricacy of NP in several categories.[11] The SF-36 survey evaluates physical function, discomfort, energy, health perceptions, and social interactions.

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It is commonly used to gauge the well-being of individuals with non-postpartum depression, helping healthcare providers make informed treatment choices and understand the broader effects of the condition.[12-15] The 14-item Treatment Satisfaction Questionnaire for Medication (TSQM) assesses patient satisfaction in terms of overall satisfaction, side effects, efficacy, and convenience. This is important because satisfied patients are more likely to adhere to treatment, and understanding their treatment satisfaction can improve their quality of life.[16-18] Neuropathic pain impacts both individuals and society by reducing quality of life, and productivity, and increasing healthcare costs.[19] Despite the extensive prevalence of NP and its significant impact, there has been limited research into the relationship between treatment satisfaction and quality of life for individual patients. A greater understanding of the factors impacting treatment satisfaction may lead to better outcomes for persons with NP, making this a crucial knowledge gap. Any comprehensive strategy for managing NPs should prioritize improving the overall health and well-being of those affected, as well as pain relief. Therapeutic choices for NP management must match patients' expectations while also improving their quality of life.

METHODS

The study was a single-center, prospective, observational investigation that assessed the treatment satisfaction and Quality of Life (QoL) among individuals experiencing neuropathic pain. This method allows researchers to examine the relationships between variables at a single point in time, making it perfect for studying the prevalence of specific features in a defined population (for instance, satisfaction with treatment and adherence to medication). The research, which took place in a tertiary hospital from March to August 2023, included a sample of patients who had neuropathic pain. "To gather thorough data, the study used four survey instruments. Demographic and Clinical Data, Medication Adherence Rating Scale (MARS), Visual Analogue Scale, Short Form Health Survey-36". Prior to participating in the study, each patient gave their written informed consent.

The study was conducted over a period of six months at a tertiary care hospital (Vivekanandha Medical Care Hospital) in Tamil Nadu, which is equipped to treat a variety of medical ailments, including neuropathic pain. Vivekanandha Medical Care Hospital (VMCH) granted ethical approval (Ref no: SVCP/IEC/MAR/2023/008) before the study, which offered an appropriate environment for analyzing the correlations between treatment satisfaction, adherence towards medication, and health-related quality of life in individuals experiencing neuropathic pain.

Participants in the study have been thoughtfully selected among those who visited the hospital's Neurology Department especially to seek treatment for neuropathic pain. When the participants arrived, they were informed about the objectives and goals of the study, ensuring that they appreciated the importance of their involvement.

Following the training session, all patients were determined to be eligible for the experiment, and their medical histories were thoroughly reviewed. This method verified that participants met the standards while actively engaging in the study. The study's objective is to provide vital insights into the management of neuropathic pain by carefully choosing participants based on their requirements and backgrounds.

Based on the following inclusion criteria, individuals were chosen: Female and male patients ranged in age from 18 to 75. Participants with neuropathic pain, who have an S-LANSS score of at least 12, agreed to participate after being fully informed about the trial's objectives and providing informed permission. Those who were unable or unwilling to offer informed consent, pregnant or nursing women, and those who intended to become pregnant during the study period were all excluded.

Intervention

In accordance with the defined inclusion and exclusion criteria, 300 individuals were recruited for the study with the expected sample size of 300 in this case. Patients with neuropathic pain, identified by a S-LANSS pain score of 12 or higher, up to a maximum score of 24, were initially assessed in order to address their pain management needs. A patient with this score is identified as having neuropathic pain. In this study, a number of assessment tools were used to measure treatment satisfaction, medication adherence, and health-related quality of life in individuals experiencing neuropathic pain. The following instruments were utilized: Patient Demographics and Clinical Data, Medication Adherence Rating Scale (MARS), Visual Analog Scale (VAS), Short Form Health Survey (SF-36), Treatment Satisfaction Questionnaire for Medication (TSQM version 1.4) (Figure 1).

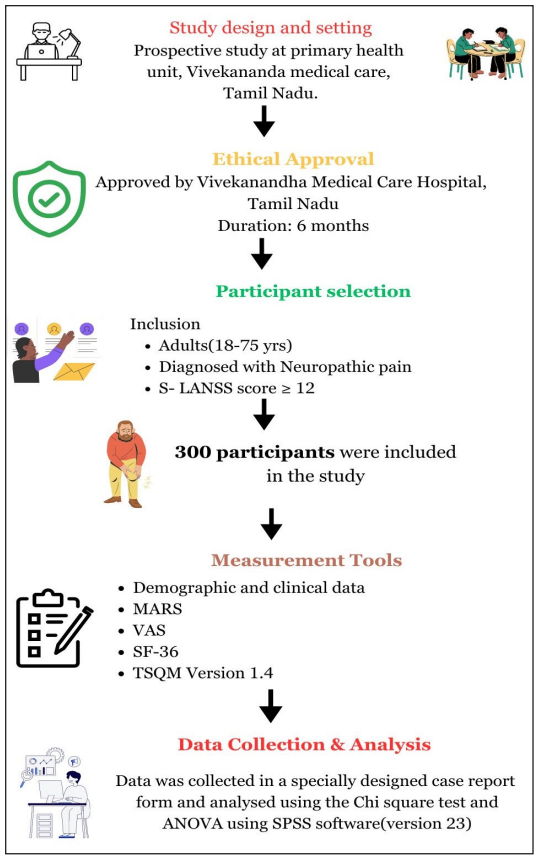

Figure 1. Methodology Flow chart. ANOVA- one-way-analysis of variance; S-LANSS- Self-Administered Leeds Assessment of Neuropathic Symptoms and Signs; SPSS- Statistical Product and Service Solutions; TSQM- Treatment Satisfaction Questionnaire for Medication.

The Visual Analogue Scale[20] which measures self-reported pain was used. This was an uncomplicated method where patients placed their current pain levels using the same scale. Finally, how the patients felt during the last two to three weeks before the treatment was assessed using the "Treatment Satisfaction Questionnaire for Medicine (TSQM)"[21] to evaluate their satisfaction with the treatment.

Subjects in the study imparted demographic information, as well as information regarding their medical conditions and their present state of health. To analyze compliance with medications, the Medication Adherence Rating Scale (MARS)[22] was employed as a self-assessment tool, with three primary areas of importance: behavior, attitudes towards medicine, and side effect experiences. The MARS consists of ten questions which include a yes or no answer, with adherence graded as 1 and non-adherence as 0. In addition, the Short Form Health Survey-36[23] was implemented to evaluate eight aspects of health-related quality of life, including physical and social functioning, as well as psychological well-being.

The SF-36 comprises 36 items, each rated on a scale that reflects various dimensions of the patient's overall health.

Combination therapy for neuropathic pain management

By employing various pharmaceutical therapies, the study stresses the efficacy and patient satisfaction of their combination in addressing neuropathic pain. Patients frequently select pregabalin in conjugation with methylcobalamin and nortriptyline, illustrating the current therapy techniques that seek to enhance pain management by employing a multimodal approach.

Data collection

Whenever a subject was enrolled in the study, baseline information of the subject was taken. Such general information included; the age & gender of the patient& BMI, the social history of the patient, incidence, family health history, comorbidities, therapies or medications being taken concurrently, and creatinine clearance. As a part of the clinic visit, patients were interviewed in person to collect data. This data was afterward captured for output as well as analysis and was done into predefined case report forms. Graphical analyses were also done for treatment satisfaction and compliance with medication and health-related quality of life (QoL) for individuals suffering from neuropathic pain.

Primary outcome: The Short Form Health Survey (SF-36) and the Treatment Satisfaction Questionnaire for Medication (TSQM) was utilized to assess the degree of treatment satisfaction and its association with quality of life (QoL), especially among neuropathic pain participants.

Secondary outcome: Measuring patient adherence to prescribed medicine (using the Medication Adherence Rating Scale [MARS]) and its impact on treatment satisfaction and quality of life (QoL) were an essential part of this research.

Data analysis

"Quantitative data was interpreted statistically

using the chi-square test and ANOVA, and a p-value of less than 0.05 WAS considered statistical significance. All statistical analyses were conducted using SPSS software version 23.

RESULT

Out of the 300 patients who were monitored throughout the research period, 264 of them satisfied the requirements for inclusion. The average age of the patients was 39.27 ± 45.25 years, with 62.12% of the sample being male. Patients aged 56 to 75 years represented 50.38% of the individuals with neuropathic pain in the study population. Obesity (9.47%) and being overweight (26.51%) were the primary predisposing factors for neuropathic pain in this group. The most common social habit among the study participants was consuming tea and coffee (26.51%), with an average consumption rate of 44.4 ± 21.04. Diabetes mellitus (32.20%) was the most prevalent comorbid condition in the study population (Table 1). 51.65% of patients reported using pregabalin, nortriptyline, and methylcobalamin as part of a triple treatment. A lower proportion of respondents said they have used monotherapies such as duloxetine, amitriptyline, pregabalin, and gabapentin. According to Table 2, 21.21% of respondents reported using a combination of gabapentin and nortriptyline with methylcobalamin, 11.36% of respondents used pregabalin plus nortriptyline, 7.57% of respondents used gabapentin plus nortriptyline, and so forth.

Adherence level: According to the MARS (Medication Adherence Rating Scale), Figure 2 illustrates that 198 patients demonstrated elevated adherence levels, while 66 patients exhibited lower adherence levels.

Health-related Quality of Life (HrQoL): The Short form Health Survey-36 is a 36-item questionnaire that evaluates eight aspects of health: Physical functioning (10 items), Role limitations due to

Table 1: Patient data encompassing socio-demographic and clinical details

Variables		No. of patients (n)	Percentage (%)
Gender	Male	164	62.12%
	Female	100	37.88%
Age (Years), Mean ± SD		39.27±45.25	
Age Distribution, n (%)	18-35	24	9.09%
	36-55	107	40.53%
	56-75	133	50.38%
BMI	Underweight	15	5.68%
	Normal	149	56.44%
	Overweight	70	26.51%
	Obesity	25	9.47%
	Extreme Obesity	5	1.89%
Body Mass Index, Mean ± SD		52.8±59.24	
Social History	Tea & Coffee	70	26.51%
	Smoking	25	9.47%
	Alcohol	39	14.77%
	Tobacco	20	15.15%
	Other	68	25.75%
Comorbidities	Hyperlipidemia	19	7.20%
	Diabetes	85	32.20%
	Hypertension	14	5.30%
	DM & HTN	50	18.94%
	Stroke	14	5.30%
	Others	40	15.15%

Abbreviation: BMI, Body Mass Index; SD, Standard Deviation; DM, Diabetes Mellitus; HTN, Hypertension

Table 2: Medication history and manner of prescribing for neuropathic pain

Medications	No. of patients	Percentage
Pregabalin	7	2.65%
Gabapentin	2	0.75%
Amitriptyline	8	3.03%
Duloxetine	2	0.75%
Pregabalin + Nortriptyline	30	11.36%
Gabapentin + Nortriptyline	20	7.57%
Pregabalin + Nortriptyline + Methylcobalamin	139	52.65%
Gabapentin + Nortriptyline + Methylcobalamin	56	21.21%

physical health (4 items), Bodily pain (2 items), General health perceptions (5 items), Energy/ Vitality (4 items), Social functioning (2 items), Role limitations due to emotional issues (3 items), and Mental health (5 items).

HRQoL using Euroqol VAS score: The scale spans from 0 to 100, with 0 denoting the lowest and 100 denoting the highest condition (Figure 3).

Treatment Satisfaction Questionnaire for Medication (TSQM version 1.4): Findings from Figure 4 revealed that individuals exhibiting treatment satisfaction levels surpassing 50 experienced fewer challenges in SF-36 domains (Physical functioning, Physical role, Pain, General Health, Vitality, Social function, Emotional role, and Mental health). These results imply that higher satisfaction correlated with an enhanced quality of life. An evident link emerged between general health and treatment satisfaction (p=0.039).

Patients expressing higher treatment satisfaction reported greater improvement in their general health domain than those less satisfied. Among the more content patients, the overall SF-36 score notably surpassed, indicating an enhanced Quality of Life (Table 11).

DISCUSSION

In a study on neuropathic pain (NP), 264 out of 300 participants satisfied the inclusion criteria. This provided significant new information about the traits, treatment modalities, and adherence rates of people with NP. The results show patterns in demographics, drug use, and comorbidities that could guide future studies and therapeutic procedures.

The average age of the participants was 39.27 ± 45.25 years, and 62.12% of them were male. This raises the possibility of gender disparities in neuropathic pain prevalence and reporting. The age group of 56-75 had the highest prevalence (50.38%), which is consistent with research showing that comorbidities and neurodegeneration associated with aging increase the risk of chronic pain.[24] Obesity was also found to be a major risk, with 9.47% of participants classed as obese and 26.51% as overweight. Obesity, with a mean BMI of 52.8 ± 59.24, has been linked to worsening neuropathic pain by manually compressing peripheral nerves.[25] The most common co-occurring condition was diabetes mellitus, affecting 32.20 percent of patients; this is consistent with previous research linking

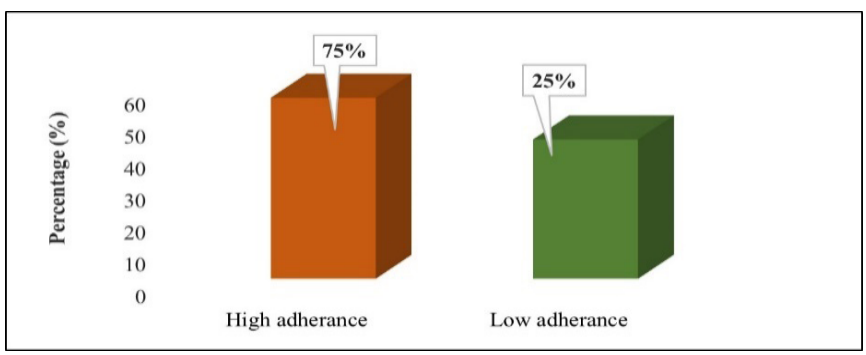

Figure 2. Categorizing study participants based on their adherence status.

Table 3: Domain 1 - Physical functioning in neuropathic pain patients

Domain-1	Physical functioning	Mean ± SD	p-value
1.	Participants' views on capability in doing vigorous activities	1.455 ± 0.5024	
2.	Participants' views on the ability to perform moderate activities	1.455 ± 0.4587	
3	Participants' views on performing lifting or carrying groceries	1.358 ± 0.2589	
4.	Participants' views on their ability to climb several flights of stairs	1.265 ± 0.2458	
5.	Participants' views on their ability to climb one flight of stairs	1.478 ± 0.4785	**<0.001**[s]
6.	Participants' views on their ability to bend, kneeling, or stoop	1.785 ± 0.2548	
7.	Participants' ability to walk more than a mile	1.485 ± 0.2648	
8.	Participants' ability to walk several blocks	1.485 ± 0.2685	
9.	Participants' views on their ability to walk one block	1.485 ± 0.2584	
10.	Participants' ability in bathing or dressing up themselves	1.587 ± 0.2698	

Abbreviation: s, significance; SD, Standard Deviation

diabetes to diabetic neuropathy and associated pain.[26] Other co-occurring conditions included hypertension (5.30%) and hyperlipidemia (7.20%), suggesting that patients with metabolic syndrome may be more susceptible to neuropathic pain. Most patients used a combination treatment regimen; the most popular combinations were gabapentin and nortriptyline (21.21%), along with methylcobalamin and nortriptyline (52.65%). This preference for combination therapies is consistent with clinical guidelines that support multimodal approaches for effective neuropathic pain management.[27]

The Medication Adherence Rating Scale (MARS) shows that 198 study participants adhere to the treatment regimen and 66 have poor adherence (Figure 2). Treatment adherence is more crucial in ensuring the effective management

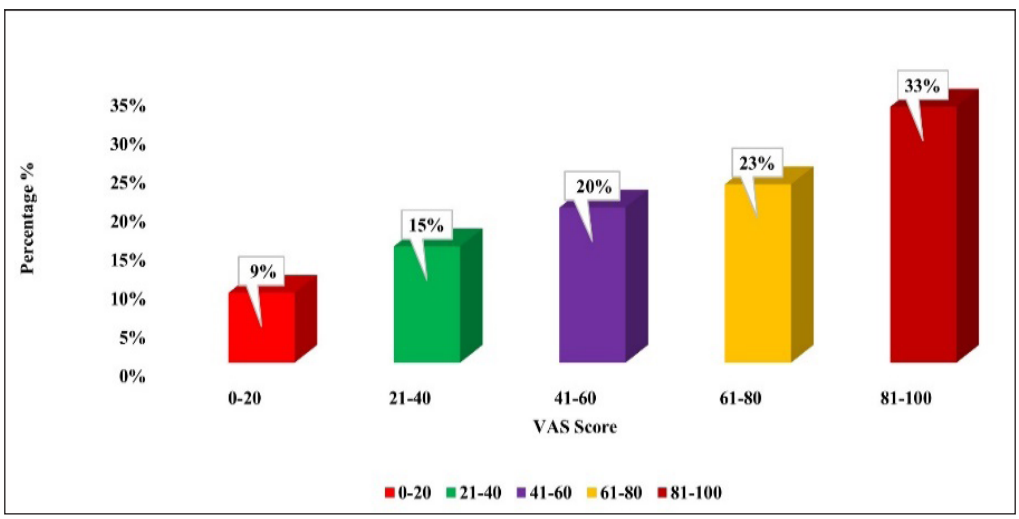

Figure 3: The patient's health condition based on the EQ-VAS
Abbreviation: EQ-VAS, Euroqol Visual Analogue Scale; HRQoL, Health-Related Quality of Life

Table 4: Domain 2 – Role limitation resulting from physical health

Domain-2	Role of limitations due to physical health	Mean ± SD	p-value
11.	Participants' views on cutting down the amount of time spent on work	1.645 ± 0.9654	<0.001[s]
12.	Participants' views on accomplishing less than they would like indicate feelings of underachievement.	2.056 ± 0.1458	
13.	Participants' perspectives on the restrictions they face regarding the types of work or activities they can engage in.	3.256 ± 0.2458	
14.	Participants' opinions on the challenges they encounter in carrying out work or activities.	2.564 ± 0.2458	

Abbreviation: s, significance; SD, Standard Deviation

Table 5: Domain 3 – Role of limitations due to emotional problems

Domain-3	Role limitations due to emotional problems	Mean ± SD	p-value
15.	Participants' opinions on reducing the time allocated to work or other activities.	1.254 ± 0.2548	**<0.001[s]**
16.	Participants' views on accomplishing less than they would like reflect their perceived productivity.	2.365 ± 0.3645	
17.	Participants' views on not doing jobs or other duties as meticulously as usual	5.235 ± 0.2658	

Abbreviation: s, significance; SD, Standard Deviation

Table 6: Domain 4 – Energy/fatigue

Domain-4	Energy/fatigue	Mean ± SD	p-value
18.	Participants' views on feeling full of life	2.165 ± 1.6985	**<0.001[s]**
19.	Participants' views on having a lot of energy	2.036 ± 1.4658	
20.	Participants' views on feeling worn out	2.458 ± 1.4536	
21.	Participants' views on feeling tired	3.185 ± 1.4589	

A significance level of **p < 0.001*** is deemed statistically significant
Abbreviation: s, significance; SD, Standard Deviation

Table 7: Domain 5 – Emotional well-being

Domain-5	Emotional well-being	Mean ± SD	p-value
22.	Participants' views on whether they have been very nervous reveal insights into their overall emotional well-being.	2.154 ± 1.6589	**<0.001[s]**
23.	Participants' views on feeling so down in the dumps that nothing could cheer them up highlight experiences of emotional distress.	2.164 ± 1.4583	
24.	Participants' views on whether they have felt calm and peaceful reflect their current state of mental tranquillity.	2.000 ± 1.4596	
25.	Participants' views on feeling downhearted and blue indicate the presence of sadness or emotional struggle.	2.894 ± 1.6895	
26.	Participants' views on whether they have been happy provide a perspective on their overall life satisfaction and mood.	1.256 ± 1.4589	

Abbreviation: s, significance; SD, Standard Deviation

Table 8: Domain 6 – Social functioning

Domain-6	Social functioning	Mean ± SD	p-value
27.	Participants' perspectives on how physical health or emotional issues impacted their usual social activities during the previous four weeks.	2.891 ± 1.6589	
28.	Participants' perspectives on how their physical health or mental issues impacted their social activities over the last four weeks emphasized the difficulty they faced in maintaining relationships with friends and family.	3.182 ± 1.4598	**<0.001**[s]

Abbreviation: s, significance; SD, Standard Deviation

Table 9: Domain 7 - Pain

Domain-7	Pain	Mean ± SD	p-value
29.	Participants' views on bodily pain experienced during the past 4 weeks	2.546 ± 2.5698	
30.	Participants' views on the intensity of pain interfered with their normal work during the past 4 weeks	1.565 ± 0.5698	**<0.001**[s]

Abbreviation: s, significance; SD, Standard Deviation

Table 10: Domain 8 – General health

Domain-8	General Health	Mean ± SD	p-value
31.	Participant view on general health	2.245 ± 1.1569	
32.	Participants view on susceptible to getting ill than others.	1.324 ± 0.9035	
33.	Participants' views on being as robust as anyone they know reflect their perceived level of physical strength and resilience.	2.273 ± 1.3645	**<0.001**[s]
34.	Health is expected to decline	1.036 ± 1.5968	
35.	Health is excellent	3.859 ± 0.3482	
36.	Participants' views on their current health, compared to one year ago, indicate whether it is better, worse, or the same.	2.647 ± 1.5893	

Abbreviation: s, significance; SD, Standard Deviation

Table 11: SF-36 Score correlation with the treatment satisfaction

Satisfaction	No. of patients (n)	Mean ± SD
Complete satisfaction < less than 50	85	4.598 ± 0.5698
Complete satisfaction > less than 50	179	6.987 ± 0.9687

Abbreviation: SD, Standard Deviation; SF-36, Short Form Health Survey

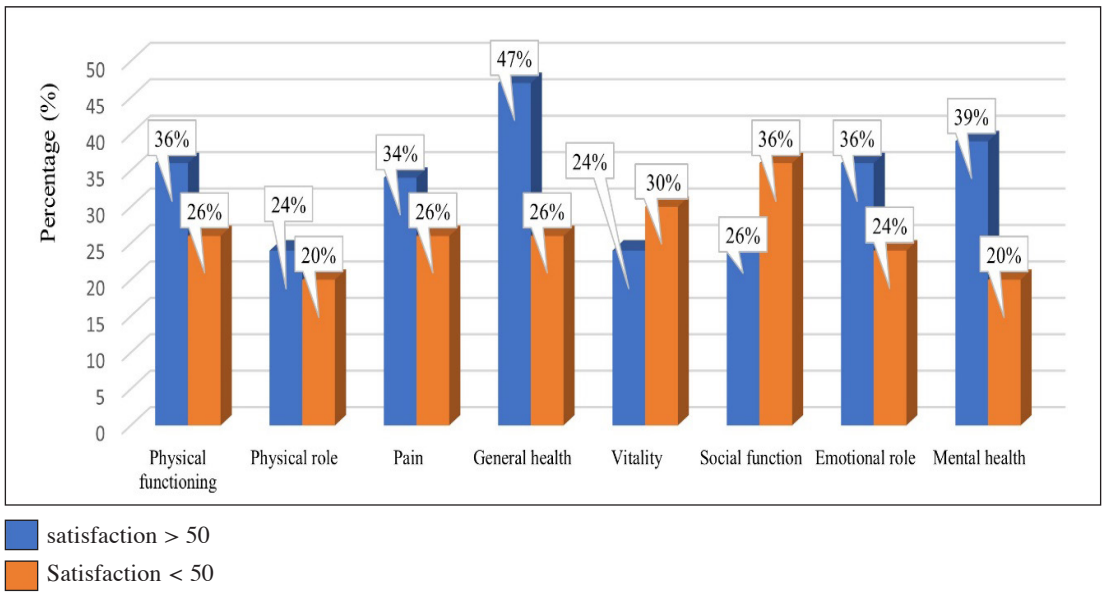

Figure 4. Linking TSQM response categories to SF-36 domains. SF-36: Short Form Health Survey
Abbreviation: TSQM, Treatment Satisfaction Questionnaire for Medication; SF-36, Short Form Health Survey

of Neuropathic pain since it affects treatment outcomes and the overall quality of life.[28] The findings of the study show that patients are more likely to follow their treatment plans when they can effectively regulate their symptoms.

The Short Form Health Survey-36 questionnaire has been utilized to evaluate personal well-being, and the findings indicated significant inadequacies in a variety of categories, including social behavior, emotional stability, and physical functionality. The analysis found substantial disparities ($p < 0.001$) across multiple categories, indicating that patients with NP face significantly more restrictions than the general population.

SF-36 questionnaire was used in the study to evaluate the number of categories, illustrating the significant influence of Neuropathic pain on Health-Related Quality of Life. Each domain confirms the significant weakness, demonstrating the diverse spectrum of challenges that the public faces toward Neuropathic pain. The results across all domains show a statistically significant p-value of < 0.001, highlighting the profound impact of neuropathic pain on multiple aspects of health, including physical functioning, emotional well-being, energy levels, pain, social interactions, and general health. These negative attitudes underscore the widespread impact of NP on both physical and mental health.

The Treatment Satisfaction Questionnaire for Medication (TSQM) results indicated that greater treatment satisfaction correlated with higher scores in all SF-36 domains (Figure 4). Patients with satisfaction levels of more than 50 reported fewer difficulties in various aspects of life impacted by neuropathic pain, demonstrating that effective pain management alternatives can enhance overall quality of life.

This study has a number of strength and limitation. Among 300 participants, 264 met the inclusion criteria. This facilitates an analysis of a large amount of data, strengthening the predictability of results.[30] The study investigated demographic information like age, gender, and body mass index (BMI) and revealed several noteworthy trends, such as the fact that neuropathic pain is more common in older adults and that obese patient increases pain intensity.[31] The results showed that gains in quality of life were positively correlated with treatment satisfaction, underscoring the importance of patient-centered care in pain management. The study's cross-sectional design limits its capacity to demonstrate causal links between treatment approaches, quality of life outcomes, and demographic characteristics. While diabetes has been established as a prevalent co-morbidity limited studies have been conducted regarding additional possibly important psychological ailments such as anxiety and depression.[1] This lack of investigation may result in the minimizing of vital elements that have a major impact on how individuals perceive pain

and how favorable therapeutic medications are. Due to the inadequate availability of continuous monitoring data, it is challenging to assess the long-term consequences of treatment and enhancements in quality of life for those suffering from neuropathic pain.

For its relevance in clinical practice, enhanced adherence rate in the study demonstrates the necessity to improve medication adherence in the individual. Physicians can utilize the MARS and other tools to evaluate adherence, optimize medication regimens, and counsel patients regarding the importance of adherence to medication. By analyzing the specific demographics, it is found that older individuals, diabetics, or those who are obese will benefit from a tailored therapy regimen. With these data, physicians can make targeted therapy decisions for different individuals. Additionally, the study suggests that effective pain therapy is required to address comorbidities, like psychological conditions like anxiety and sadness. Physicians and psychological specialists are encouraged to provide comprehensive therapy that addresses NP's physical and psychological demands. Recent studies supporting broad methods for pain management that include psychological aspects validate this multidisciplinary approach.

In conclusion, this study explores the impact of demographic factors such as gender, age, diabetes, and obesity on neuropathic pain (NP) and overall health. It highlights the strong connection between pain relief satisfaction and quality of life, advocating for individualized, multimodal approaches to pain management. To enhance future clinical practices, it is crucial to focus on improving medication adherence, tailoring treatments based on demographic characteristics, and integrating psychological support for better patient outcomes. Furthermore, enhancing care organization, fostering effective collaboration among healthcare professionals, and improving clarity in treatment protocols will optimize intervention outcomes. The study concludes that managing neuropathic pain effectively requires a holistic, multidisciplinary strategy to address the diverse and complex needs of patients.

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DISCLOSURE

Ethics: Ethical approval was obtained from the Institute Ethics Committee of Vivekanandha Medical Care Hospital (Ref no: SVCP/IEC/MAR/2023/008). An informed consent was obtained from the individual to participate in the study.

Data availability: All data generated or analyzed during this study are included in this published article. Additional data may be available from the corresponding author upon reasonable request.

Financial support: None

Conflicts of interests: None

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