International Journal of Medical and Pharmaceutical Research

Online ISSN-2958-3683 | Print ISSN-2958-3675
Frequency: Bi-Monthly
Available online on: https://ijmpr.in/

Original Article

Profiling of Patients Presenting with Knee Pain At NIVAAN, A Chain of Multidisciplinary Pain Management Clinics in North India

Dr. Jyotsna Agarwal[1], Dr. Naveen Talwar[2], Dr. Rohit Gulati[3], Dr. Abhimanyu Rana[4], Dr. Garima Gupta[5], Dr. Sagar Rakesh Tyagi[6], Dr. Ankit Pagoria[7]

[1]Principal Investigator MBBS, MD, FIPM, EDPM Pain Management Specialist & Head, Clinical Development Nivaan Care
[2]Co-Investigator MBBS, MS (Orthopedic) Senior Orthopedic Consultant & Medical Director Nivaan Care
[3]Co-Investigator MBBS, DA, DNB (Anesthesia) Pain Management Specialist & Associate Director Nivaan Care
[4]Co-Investigator MBBS, DNB, DA, FIPM, EFK (Brussels, Belgium) Pain Management Specialist Nivaan Care
[5]Co-Investigator MBBS, DA, FIPM Pain Management Specialist Nivaan Care
[6]Co-Investigator MBBS, MD, IDRA, FIPM Pain Management Specialist Nivaan Care
[7]Co-Investigator BHMS, MBA Program Manager – Clinical Research & Data Nivaan Care

OPEN ACCESS

Corresponding Author:

Dr. Jyotsna Agarwal
Principal Investigator MBBS, MD, FIPM, EDPM Pain Management Specialist & Head, Clinical Development Nivaan Care
Email: jyotsna.doctor@gmail.com

Received: 27-05-2026
Accepted: 10-06-2026
Available online: 29-06-2026

ABSTRACT

Objectives: This study aimed to evaluate the demographic and clinical characteristics of patients presenting with knee pain and managed under a standardized, multidisciplinary nonsurgical protocol at a network of pain management clinics in North India.

Background: Knee pain is among the most common musculoskeletal complaints in India and is often exacerbated by delayed diagnosis, poor access to nonsurgical care, and increased obesity rates. This study evaluated the demographic and clinical profiles of patients treated via a standardized, multidisciplinary, nonsurgical knee pain protocol across a network of 14 pain clinics in North India.

Methods: A retrospective observational analysis was conducted on 4505 patients presenting with knee pain from March 2024 to March 2025. Patients underwent protocol-driven management, including platelet-rich plasma (PRP) injections, genicular nerve radiofrequency ablation, physiotherapy, nutritional optimization, and psychological counseling. Clinical, demographic and pain-related data were collected and analyzed via descriptive and inferential statistics.

Design: Retrospective observational study. Consecutive patient records from March 2024 to March 2025 were reviewed to profile outcomes.

Setting: A network of 14 multidisciplinary pain management clinics in North India (tier 1 and tier 2 cities) was involved. These secondary-level clinics provide integrated nonsurgical care for knee pain, including physiotherapy, nutritional support, and psychological counseling.

Participants: The cohort comprised 4505 consecutive adult patients (56.3% female; mean age 57.3 ± 12.9 years) who presented with knee pain and completed at least one follow-up between March 2024 and March 2025. Inclusion criteria were presentation with knee pain of any etiology and receipt of protocol-driven care. Patients with exclusively surgical pathologies (e.g., Grade IV osteoarthritis, complete ligament tears, meniscal injuries, fractures, infections or malignancies) were referred for surgical management and were thus excluded from analysis.

Intervention: Management was performed as per a standard treatment protocol. All patients received comprehensive pain management, including medical management, nonsurgical interventions (if indicated), nutritional advice, pain counseling and physiotherapy. Interventions included platelet-rich plasma injections, radiofrequency ablation of the particular nerves, and, in some patients, corticosteroid injections.

Outcome measures: Outcome measures:

- Primary outcomes: Knee pain patient profiling was performed on the basis of pain severity (0–10 scale), pain duration (acute/chronic), and clinical diagnosis (e.g., osteoarthritis, ligament injury) upon presentation to the pain clinic.
- Secondary outcomes: Knee pain patient profiling was performed on the basis of body mass index (BMI), comorbidities (e.g., hypertension, diabetes), and subgroup comparisons by age, sex, and BMI to explore variations in clinical profiles.

Results: Of the 4,505 patients who presented with knee pain, the majority were females (56.3%), with a mean age of 57.3 ± 12.9 years. A significant proportion (11.5%) were under 40 years of age. Obesity was highly prevalent, with 81.7% of patients classified as obese or morbidly obese. Knee osteoarthritis was the most common diagnosis (90.4%), and 91.3% of patients reported chronic pain, with a mean VAS score of 7.7 ± 0.95. Among younger patients, ligament injuries (33.1%) and obesity were frequently observed. Despite prior consultations with surgeons or physiotherapists or the use of over-the-counter medications by more than 95% of patients, severe pain persisted, underscoring the need for specialized pain management.

Conclusion: This study highlights the demographic and clinical burden of knee pain in patients attending a chain of multidisciplinary pain clinics in North India. The findings emphasize the importance of early, protocol-based conservative management, particularly for women and younger adults, to address the increasing burden of symptomatic knee conditions in India.

Keywords: Knee pain, osteoarthritis, nonsurgical treatment, obesity, multidisciplinary care, India, chronic pain, PRP, radiofrequency ablation.

INTRODUCTION

Knee pain is one of the most commonly reported musculoskeletal complaints, and its prevalence increases with age (1). According to the World Health Organization, musculoskeletal disorders—including those affecting the knee—are the leading cause of disability worldwide and place a significant burden on healthcare systems (2). In India, the prevalence of musculoskeletal disorders ranges widely from 6.92% to 76.8%, underscoring the considerable public health challenge posed by these conditions (3).

The increasing burden of knee pain in India is attributed to delayed diagnosis, limited awareness of nonsurgical treatment options, and inadequate access to specialized care (4). These factors contribute to rapid disease progression, reduced functional independence, and a decline in quality-adjusted life years (QALYs), reinforcing the urgent need for timely and effective interventions (5). While conservative management typically involves pharmacologic therapies and physical rehabilitation, emerging minimally invasive interventions offer the potential to preserve joint function and delay or avoid surgery (6). However, patient awareness and utilization of such treatment options remain limited (7)

To address these challenges, a chain of pain clinics in North India has implemented a standardized, protocol-driven, multidisciplinary approach for the early management of knee pain. This model works in 14 pain clinics in Tier 1 and Tier 2 cities and emphasizes personalized, patient-centered care initiated at early diagnosis, with the goal of reducing the need for surgical intervention. This study presents real-world data on the demographic characteristics of patients treated via this nonsurgical intervention protocol. The findings aim to enhance the understanding of patient characteristics and presentation patterns, thereby informing the planning and implementation of context-specific care models across healthcare centers in India.

MATERIALS AND METHODS

Study Design

This study was conducted as a retrospective observational study to review the clinical presentation of protocol-driven nonsurgical interventions for knee pain. The study period considered patients managed at the chain of clinics from March 2024 to March 2025.

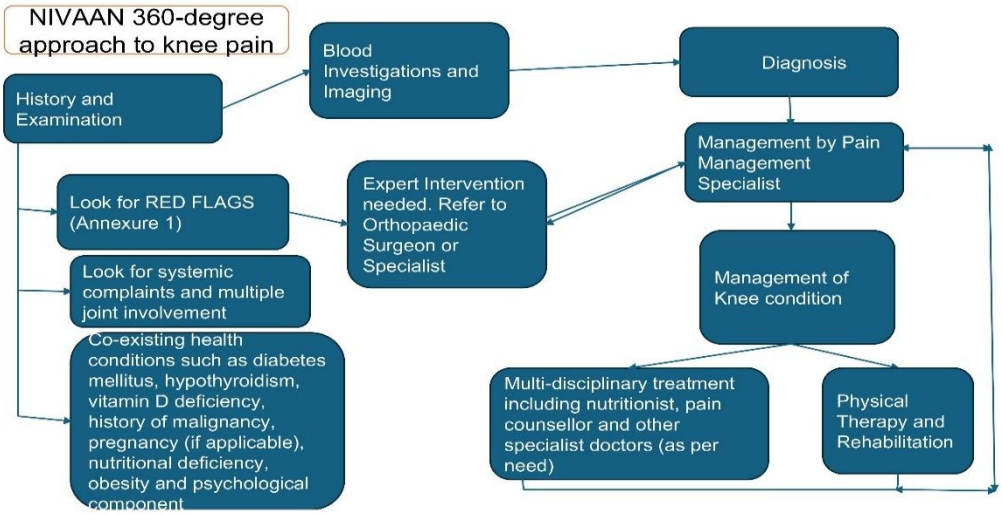
Ethical considerations

Ethical clearance for the study was obtained from the Gene Bandhu Independent Ethics Committee (Ref- ECG11/2025). All patient data were deidentified to maintain confidentiality and privacy.

Study Setting
The study was conducted at a multidisciplinary network of 14 pain clinics in tier one and tier two cities in North India that provide integrated services, including physiotherapy, nutrition, and psychological counseling.

Sample size
All patients who reported to the clinic with knee pain from March 2024 to March 2025 and who underwent at least one follow-up session were included in this study. The number of patients with knee pain included was 4505.

Procedures
All patients underwent a comprehensive clinical assessment, including a detailed history and physical examination. Imaging studies, such as knee X-rays and MRI, were performed per clinical judgment to confirm the diagnosis. On the basis of the clinical and radiological findings, patients were managed in accordance with standardized pain management clinical protocols. All knee pain patients underwent management as mentioned in Figure 1.



Annexure 1	Red flags for Knee pain
1.	New onset pain in extremes of age
2.	Acute trauma
3.	Fever
4.	Unintentional Weight loss
5.	Suspicion of or known (current or past) benign/ malignant tumour
6.	Infection

Figure 1. Clinical Workflow for Pain Management in the Study.

The Pain Management Specialist (PMS) served as the primary physician. Comprehensive clinical evaluation—including detailed history, physical examination, laboratory investigations, and imaging—was performed to establish the diagnosis. Pain management was subsequently administered based on standardized clinical protocols .

The treatment modalities included the following:
Knee osteoarthritis (Knee OA) For knee OA, KL grades I—III Intra-articular plate-rich plasma (PRP) injections were performed, with a total of 3 sittings at 3 weekly intervals.

Radiofrequency ablation (RFA) of the genicular nerves was combined with PRP if moderate to severe pain was present. For severely painful knees, an osteoarthritic-intra-articular steroid was injected into the inflamed knee, followed by PRP therapy after 4 weeks. For partial ligament injuries, PRP therapy was administered .Patients diagnosed with surgical

pathologies (e.g., Grade IV OA, complete ligament tears, meniscal injuries, fractures, infections, or malignancies) were referred to orthopedic surgeons or appropriate specialists.

Postintervention, all patients were advised on a 6-week physiotherapy regimen. Patients who were overweight, undernourished or had nutritional deficiencies such as anemia or vitamin deficiencies were referred to in-house nutritionists. Where appropriate, patients were referred to in-house pain counsellors for better understanding and adaptation to their pain.

Data collection

Clinical and procedural data, including electronic health records through the institutional HIS (Hospital Information System) system, were captured in a structured format. The chain of pain management clinics has developed a comprehensive electronic health record (EHR) system—a digital platform designed to capture and manage the entire patient journey, from appointment booking and initial consultations to multidisciplinary care plans and ongoing clinical interventions. This system documents each stage from appointment booking and initial consultations to multidisciplinary treatment plans (care pathways) and ongoing clinical interventions. The EHR is actively used by both clinicians and care coordinators to ensure continuity of care and real-time monitoring. Structured to collect high-quality, anonymized data across diverse patient profiles, the system serves as a robust foundation for clinical research and outcome analysis.

Data analysis

Statistical analysis was conducted via the Statistical Package for the Social Sciences (SPSS) software version 23. The analysis included both descriptive and inferential statistics. Descriptive statistics included frequencies, percentages, averages, and standard deviations. Inferential statistics were applied to assess the significance of differences between groups via independent t tests and chi-square tests, as appropriate.

- Descriptive statistics were used to summarize the data across the following domains:
- Baseline Profiling: demographics, anthropometry, occupation/activity levels, comorbid conditions
- Knee pain details: pain site, diagnosis, and past treatments
- Patient pain indicators: pain score, pain type/intensity of pain
- Profiling of young patients with knee pain
- Inferential statistics were used to assess the pain profile across subgroups categorized by age, sex, BMI, and baseline pain intensity. A p value < 0.05 was considered statistically significant.

RESULTS-

This study analyzed the clinical and demographic characteristics of 4,505 patients presenting with knee pain at a network of multidisciplinary pain clinics across North India.

The cohort comprised 2,536 females (56.3%) and 1,969 males (43.7%) ($p < 0.00001$). The mean age was 57.3 ± 12.9 years, with males being older on average (58.4 ± 14.36 years) than females were (56.4 ± 11.68 years) ($p < 0.00001$). While the majority of patients were aged 60 years and above (41.1%), a considerable proportion (11.5%) were younger than 40 years, which is a matter of clinical concern.

Distinct gender-based differences were observed in occupational roles. Among male patients, 58.7% were engaged in sedentary occupations such as desk jobs or government/service roles, whereas 29.5% were involved in physically demanding work, including field jobs and postretirement activities with high physical exertion. The remaining males were homemakers (10.5%) or students (1.3%). Among females, a significant majority (76.6%) were homemakers. Only 5.2% were involved in physically demanding jobs, whereas 17.8% held sedentary roles such as desk jobs, government service, or low-activity retirement positions.

BMI analysis revealed a high prevalence of excess weight, with 31.1% of patients classified as morbidly obese and an additional 50.6% as obese. Obesity was significantly more prevalent among females, with 35.6% falling into the morbidly obese category, compared with 24.3% among males ($p < 0.00001$). The comorbidity data revealed that 67.1% of the cohort reported no associated health conditions. Among those with comorbidities, the most common were hypertension (12.1%), diabetes (8.8%), and hypothyroidism (5.1%). Notably, hypothyroidism was significantly more common in females (6.8%) than in males (2.9%) ($p < 0.001$) (Table 1).

Table 1- demographic and Anthropometric Profile of Patients with Knee Pain

Category	**Male**		**Female**		**Total**	
	Frequency	%	Frequency	%	Frequency	%
Age Group (n = 4505)						
< 30	99	5	62	2.4	161	3.5
31-40	181	9.1	183	7.2	364	8

41-50	211	10.7	491	19.3	702	15.5
51-60	513	26	910	35.8	1423	31.5
60+	965	49	890	35	1855	41.1
Total	1969	100	2536	100	4505	100
Mean ± SD	58.4 ± 14.36 yrs.		56.4 ± 11.68 yrs.		57.3 ± 12.9	
Median (IQR)	60 (51 - 69) yrs.		56 (50 – 64) yrs.		58 (50 – 66) yrs.	
Occupation Details (n = 4505)						
Working - Physically Demanding Job	355	18.0	94	3.7	449	10.0
Retired - High Activity	227	11.5	38	1.5	265	5.9
Working - Desk Job	427	21.7	307	12.1	734	16.3
Retired - Low Activity	728	37.0	144	5.7	872	19.4
Student	25	1.3	10	0.4	35	0.8
Home Maker	207	10.5	1943	76.6	2150	47.7
Total	1969	100.0	2536	100.0	4505	100.0
BMI Categorization (n = 1082)						
Normal (18.5 - 22.9)	48	11	50	7.7	98	9.1
Overweight (23 - 24.9)	59	13.5	41	6.3	100	9.2
Obese (25 - 29.9)	223	51.1	325	50.3	548	50.6
Morbid Obese (> = 30)	106	24.3	230	35.6	336	31.1
Total	436	100	646	100	1082	100.0
Co – morbidities (n = 4505)						
No reported comorbidity	1386	70.4	1638	64.6	3024	67.1
Hypertension	224	11.4	321	12.7	545	12.1
Diabetes	166	8.4	230	9.1	396	8.8
Diabetes, Hypertension	96	4.9	138	5.4	234	5.2
Hypothyroidism	58	2.9	173	6.8	231	5.1
Coronary Artery Disease	19	1.0	9	0.4	28	0.6
Diabetes, Hypertension, Coronary Artery Disease	9	0.5	4	0.2	13	0.3
Asthma	3	0.2	7	0.3	10	0.2
Hyperthyroidism	4	0.2	7	0.3	11	0.2
Rheumatoid Arthritis	1	0.1	5	0.2	6	0.1
Osteoarthritis	1	0.1	2	0.1	3	0.1
Post Spine Surgery	2	0.1	0	0.0	2	0.0
High Cholesterol	0	0.0	2	0.1	2	0.0
Total	1969	100.0	2536	100.0	4505	100.0

Knee osteoarthritis was identified as the primary diagnosis in 90.4% of the patients, affecting 89.6% of the males and 91.0% of the females. Other diagnoses included knee ligament or meniscus injuries (6.0%) and systemic diseases, such as fibromyalgia, myofascial pain, osteoporosis, and rheumatoid arthritis (3.6%). Among patients with additional diagnoses (n=431), the most common coexisting condition was lumbar spine disorder (55.0%), followed by cervical spine disorder (12.5%) and frozen shoulder (16.4%). With respect to pain distribution, 73.3% of patients reported isolated knee pain, whereas 26.7% experienced multisite pain involving areas such as the back, neck, leg, shoulder, thigh, and ankle. The most common combination was knee and back pain (15.4%), followed by knee pain with neck, shoulder, or leg involvement (Table 2).

Table 2- Diagnosis and Pain type

Category	Males		Females		Total	
	Frequency	%	Frequency	%	Frequency	%

Primary Diagnosis (n=4505)						
Knee Osteoarthritis	1764	89.6	2308	91.0	4072	90.4
Knee ligament / Meniscus injury	136	6.9	136	5.4	272	6.0
Systemic Diseases	69	3.5	92	3.6	161	3.6
	1969	100	2536	100	4505	100
Additional Diagnosis (n = 431) * (multiple responses)						
Lumbar Spine disorder	106	57.6	131	53.0	237	55.0
Cervical Spine disorder	21	11.4	33	13.4	54	12.5
Frozen Shoulder	28	15.2	44	17.8	71	16.4
Planter Fasciitis	8	4.3	11	4.5	19	4.4
Polyarthralgia	8	4.3	8	3.2	16	3.7
Different location pain	13	7.1	21	8.5	34	7.9
	184	100	247	100	431	100
Pain Site (n=4505)						
Knee	1446	73.4	1854	73.1	3300	73.3
Knee | Back	282	14.3	412	16.2	694	15.4
Knee| Neck| leg	84	4.3	53	2.1	137	3
Knee| Shoulder	34	1.7	23	0.9	57	1.3
Knee| Others (Back/neck/leg) (shoulder/neck/elbow)	47	2.4	45	1.8	92	2
Knee| Neck	24	1.2	65	2.6	89	2
Knee | Hip	20	1	22	0.9	42	0.9
Knee | Neck | Back	27	1.4	53	2.1	80	1.8
Knee |Elbow	5	0.3	9	0.4	14	0.3
Total	1969	100	2536	100	4505	100
Earlier Treatment availed (n= 4284)						
Physiotherapy	206	11.4	314	12.7	520	12.1
Traditional Healers	72	4	121	4.9	193	4.5
Over The Counter (OTC)	259	14.4	363	14.6	622	14.5
General Practitioners	192	10.6	247	10	439	10.2
Pain Management Specialist	13	0.7	7	0.3	20	0.5
Surgeon	1062	58.9	1428	57.6	2490	58.1
Total	1804	100	2480	100	4284	100

With respect to prior treatments, 58.1% of patients had already consulted an orthopedic surgeon. Physiotherapy was accessed by 12.1% of patients, whereas 14.5% reported using over-the-counter (OTC) medications. Smaller proportions sought care from traditional healers (4.5%), general practitioners (10.2%), and pain specialists (0.5%). Among 609 patients (14.2%) who had undergone more than one treatment modality, the most common combination involved both physiotherapy and consultation with a surgeon, reported by 55.8% of males and 57.1% of females. Additional common patterns included surgeon + OTC (15.4%), physiotherapy + OTC (7.9%), and a combination of physiotherapy, surgical consultation, and OTC use (20.2%). These findings suggest that a significant subset of patients actively seek multimodal care, with surgeon consultation forming a central component of the treatment pathway (Table 2).

Pain severity was evaluated via the visual analog scale (VAS), which revealed a mean score of 7.7 ± 0.95, with no significant difference between the sexes. Severe pain (VAS score ≥7) was reported by 93.3% of the cohort, while 6.1%

experienced moderate pain, and only 0.5% experienced mild pain. Chronic pain was reported by 91.6% of the patients. The mean duration of pain was approximately 3.5 years—3.41 ± 3.59 years in males and 3.71 ± 3.78 years in females. Notably, 16.6% of patients had experienced pain for at least 1 year, and over 25% reported a duration of pain of 5 years or more, reflecting the long-term burden of untreated or undertreated knee pain (Table 3).

Table 3- Pain Characteristics

Category	**Male**		**Female**		**Total**	
	Frequency	%	Frequency	%	Frequency	%
VAS (Visual Analogue Scale) for pain score (n = 4505)						
2	5	0.2	3	0.1	8	0.1
3	7	0.3	9	0.3	16	0.3
4	15	0.7	13	0.5	28	0.6
5	32	1.6	30	1.1	62	1.3
6	87	4.4	99	3.9	186	4.1
7	481	24.4	481	18.9	962	21.3
8	1041	52.8	1424	56.1	2465	54.7
9	288	14.6	459	18	747	16.5
10	13	0.6	18	0.7	31	0.6
Total	1969	100	2536	100	4505	100
Mean ± SD	7.7 ± 0.98		7.8 ± 0.93		7.7 ± 0.95	
Median	8		8		8	
Pain Intensity (n = 4505)						
Mild	12	0.6	12	0.5	24	0.5
Moderate	134	6.8	142	5.6	276	6.1
Severe	1823	92.6	2382	93.9	4205	93.3
Total	1969	100	2536	100	4505	100
Pain Type (n = 4505)						
Chronic	1793	91	2324	91.6	4117	91.3
Acute	176	9	212	8.3	388	8.6
Pain Duration (n = 4505)						
> 1 month	52	2.6	67	2.6	119	2.6
3 months	124	6.3	145	5.7	269	6.0
6 months	158	8.0	180	7.1	338	7.5
1 year	321	16.3	419	16.5	740	16.4
2 years	371	18.8	437	17.2	808	17.9
3 years	247	12.5	294	11.6	541	12.0
4 years	283	14.4	376	14.8	659	14.6
5 years	113	5.7	173	6.8	286	6.3
6 years	66	3.4	108	4.3	174	3.9
7 years	39	2.0	28	1.1	67	1.5
8 years	26	1.3	38	1.5	64	1.4
9 years	17	0.9	28	1.1	45	1.0
10 years	49	2.5	75	3.0	124	2.8

15 years	62	3.1	100	3.9	162	3.6
15 + years	41	2.1	68	2.7	109	2.4
Mean ± SD	3.41 ± 3.59		3.71 ± 3.78		3.5 ± 3.7	

A focused subgroup analysis of 525 patients aged <40 years revealed unique clinical patterns. Among those with BMI records (n = 171), 88.8% were overweight or obese—21.6% were overweight, 48.5% were obese, and 18.7% were morbidly obese. These findings suggest a strong link between early-onset knee pain and elevated BMI in younger individuals. In this subgroup, knee osteoarthritis remained the leading diagnosis (48.4%), followed by knee ligament or meniscus injuries (35.6%) and systemic conditions (16.0%). Lumbar spine disorders were the most common additional diagnoses (43.2%). Chronic pain affected 81.1% of the younger patients. Isolated knee pain was reported by 54.3%, while 45.7% experienced multisite involvement, including the neck and back. The mean VAS score was 7.78 ± 0.95, and severe pain was reported by 91.6% of the patients, while 7.8% reported moderate pain and only 0.6% reported mild pain. The mean duration of pain was 2.0 ± 2.2 years, with 52.1% of patients experiencing pain for two years or more. (Table 4)

Table 4- Profiling of Young Patients (less than 40 years of age)

	Male	%	Female	%	Total	%
BMI (n = 171)						
18.5 - 22.9	9	10.3	10	11.9	19	11.1
23 - 24.9	25	28.7	12	14.3	37	21.6
25 - 29.9	43	49.4	40	47.6	83	48.5
>=30	10	11.5	22	26.2	32	18.7
Total	87	100	84	100	171	100
Pain Type (n = 525)						
Chronic	218	77.9	208	84.9	426	81.1
Acute	62	22.1	37	15.1	99	18.9
Total	280	100	245	100	525	100
Diagnosis						
Primary Diagnosis (n=525)						
Knee Osteoarthritis	129	46.1	125	51.0	254	48.4
Knee ligament / Meniscus injury	103	36.8	84	34.3	187	35.6
Systemic Diseases	48	17.1	36	14.7	84	16.0
	280	100	245	100	525	100
Additional Diagnosis (n=37)						
Lumbar Spine disorder	11	52.4	5	31.3	16	43.2
Cervical Spine disorder	3	14.3	2	12.5	5	13.5
Frozen Shoulder	0	0.0	3	18.8	3	8.1
Planter Fasciitis	2	9.5	2	12.5	4	10.8
Adhesive capsulitis	2	9.5	1	6.3	3	8.1
Polyarthralgia	2	9.5	1	6.3	3	8.1
Different location pain	1	4.8	2	12.5	3	8.1
	21	100	16	100	37	100
Pain site (n = 525)						
Knee only	185	66.1	100	40.8	285	54.3
Knee | Neck	19	6.7	13	5.3	32	6.0

Knee | Back	49	17.5	41	16.7	90	17.1
Multiple sites	95	33.9	145	59.2	240	45.7
	280	100	245	100	525	100
VAS (Visual Analogue Scale) for pain score (n =525)						
3	2	0.7	1	0.4	3	0.6
4	2	0.7	2	0.8	4	0.8
5	5	1.8	3	1.2	8	1.5
6	19	6.8	10	4.1	29	5.5
7	89	31.8	67	27.3	156	29.7
8	128	45.7	130	53.1	258	49.1
9	34	12.1	28	11.4	62	11.8
10	1	0.4	4	1.6	5	1.0
Mean ± SD	7.55 ± 0.99		7.7 ± 0.95		7.78 ± 0.95	
Pain Intensity (n = 525)						
Mild	2	0.7	1	0.4	3	0.6
Moderate	26	9.3	15	6.1	41	7.8
Severe	252	90.0	229	93.5	481	91.6
Total	280	100	245	100	525	100
Pain Duration (n= 525)						
> 1 month	19	6.8	16	6.5	35	6.7
3 months	43	15.4	21	8.6	64	12.2
6 months	29	10.4	26	10.6	55	10.5
1 year	50	17.9	46	18.8	96	18.3
2 years	46	16.4	45	18.4	91	17.3
3 years	32	11.4	35	14.3	67	12.8
4 years	33	11.8	32	13.1	65	12.4
5 years	15	5.4	9	3.7	24	4.6
6 years	7	2.5	7	2.9	14	2.7
7 years	3	1.1	1	0.4	4	0.8
8 years	0	0.0	0	0.0	0	0.0
9 years	1	0.4	1	0.4	2	0.4
10 years	1	0.4	2	0.8	3	0.6
15 years	1	0.4	1	0.4	2	0.4
15+ years	0	0.0	3	1.2	3	0.6
Total	280	100	245	100	525	100
Mean ± SD	1.88 ± 1.97		2.23 ± 2.4		2.0 ± 2.2	

DISCUSSION

This real-world study conducted by a chain of pain clinics in North India provides crucial insights into the demographic and clinical characteristics of patients presenting with knee pain. The average age of the cohort was 57.3 years, with 41.1% aged ≥60 years. Knee osteoarthritis (OA) was highly prevalent, particularly among women, who composed 56.3% of the sample and had a significantly greater incidence of knee OA ($p < 0.0001$). These findings align with earlier Indian studies by Kandasamy et al. and Patel et al., which identified knee OA as predominantly affecting older women. Thati et al. also linked this sex disparity to hormonal changes and anatomical differences post menopause(8).

These patterns are consistent with those reported in the global literature, including studies by Szilagyi et al. (2023) and Faber et al. (2024), which reported increased OA incidence among postmenopausal women due to estrogen deficiency and

cartilage degeneration(9)(10) Women outnumbered men across most age groups, underscoring the higher prevalence of knee OA among Indian women.

Among patients under 40 years of age, 91.6% reported severe knee pain. Our study revealed a substantial proportion of younger individuals with knee pain, supporting Indian evidence of early-onset OA. In comparison, Khanna et al. (2019) reported a 6.54% incidence of primary knee OA in individuals under 40 years of age,(11) whereas our study revealed a markedly higher clinical prevalence of OA at 48.4% in the same age group. Additionally, 35.6% of this subgroup were diagnosed with trauma-related conditions such as ligament and meniscal injuries(11).

These findings suggest delayed healthcare-seeking behavior, with many patients likely presenting after years of progressive joint degeneration. The peak OA incidence was observed in those aged ≥60 years, with a disproportionate impact on women (4)(9).

The study also revealed a strong link between elevated BMI and early knee pain. These findings indicate a significant burden of symptomatic and disabling disease potentially driven by obesity and undiagnosed or undertreated knee injuries. Sharma et al. (2019) associated early OA onset with premature menopause (12), whereas Acharya et al. (2023) highlighted modifiable risk factors such as obesity and prior injury (13). Our results underscore the need for proactive screening and preventive measures, especially among younger women with known risk profiles.

In this cohort, 31.1% of patients were morbidly obese, and an additional 50.6% were obese. Morbid obesity was significantly more common in females (35.6%) than in males, reinforcing obesity as a major risk factor for knee pain and OA and revealing a greater sex disparity than in prior Indian studies. Pal et al. (2016) reported the highest OA incidence among overweight/obese individuals, with obesity being a significant contributing factor ($p = 0.04$), and a higher prevalence among females (31.6% vs. 28.1%)(14). Aseem et al. (2023) also reported a strong correlation between BMI and OA, with a greater prevalence in women (66% vs. 34%)(15) Joshi et al. (2018) reported that 59.5% of OA patients had a BMI between 25–30 kg/m², and 29.8% had a BMI above 30 kg/m², emphasizing the role of biomechanical, metabolic, and sex-related factors(16). These findings are further supported by global studies. Zheng et al. (2014) reported that overweight/obesity increases the risk of knee OA by 2.5–4.6 times, with a 35% risk increase per 5 kg/m² increase in BMI (18).

The mean pain score in our cohort was 7.7 ± 0.95 on a 0–10 scale, with no significant sex difference. This score is considerably higher than those reported in comparable Indian studies. Walankar et al. (2018) reported a mean score of 5.47 ± 1.07 among 60 patients (70% female)(19), whereas Kandasamy et al. (2024) reported scores ranging from 6.26–6.55 in 148 patients (mean age ~60 years, 52% females) (4). These elevated scores in our study may reflect greater disease severity, differences in pain perception, or delayed healthcare engagement. This may also reflect that patients present initially to specialists such as orthopedic surgeons and later to pain clinics, leading to a higher initial pain score at the pain clinic.

Additionally, 58.1% of our patients had previously consulted a surgeon or specialist, 12.1% had seen physiotherapists, and 14.5% relied on over-the-counter (OTC) medications. Indian data reflect diverse care-seeking patterns. The iKare study by Sancheti et al. (2017) revealed that 91.6% of patients received medications, 68.6% were prescribed supplements, and 81.9% received nonpharmacological interventions before reaching specialist clinics (20). Similarly, Sharma et al. (2019) reported that 58% of patients consulted traditional healers before presenting at tertiary care centers(12).

This study underscores the shifting clinical landscape of knee pain in India. Key findings include delayed presentations among older adults, increasing disease burden among younger individuals, and high symptom intensity across all age groups. The high prevalence of obesity and injury-related conditions, especially in younger adults, signals the urgent need for early risk identification, lifestyle-based interventions, and timely treatment, including nonsurgical interventions. Our results challenge conventional assumptions about age-related OA onset and severity and highlight the necessity for standardized early, multidisciplinary care models within healthcare systems.

CONCLUSION

This large-scale, real-world study across a network of multidisciplinary pain clinics in North India provides critical insights into the evolving profile of patients presenting with knee pain. High pain scores and underutilization of nonsurgical care pathways highlight systemic gaps in early diagnosis and intervention. Thus, there is a need to integrate protocol-driven, conservative management approaches into mainstream musculoskeletal care. Tailoring such multidisciplinary models to diverse populations in India can help address the increasing burden of knee pain through earlier access and more holistic care.

DECLARATIONS

ABBREVATIONS:

OA	–			Osteoarthritis
PRP	–	Platelet-Rich		Plasma
RFA	–	Radiofrequency		Ablation
VAS	–	Visual	Analogue	Scale
BMI	–	Body	Mass	Index
HIS	–	Hospital	Information	System
EHR	–	Electronic	Health	Record
QALY	–	Quality-Adjusted	Life	Year
OTC		–		Over-The-Counter
KL	Grade	–	Kellgren–Lawrence	Grade
PMS	–	Pain	Management	Specialist

iKare – Indian Knee Arthritis Research & Education (Study)

Ethics Committee Approval: Ethical approval was obtained from the Gene Bandhu Independent Ethics Committee (Ref: ECG11/2025, dated 09 May 2025). Informed consent was taken from all patients, and all data were anonymized to ensure confidentiality. This study was conducted in accordance with the ethical principles of the Declaration of Helsinki (2013) and adhered to national guidelines for biomedical research involving human participants

Clinical trial number: not applicable

Consent for Publication: Not applicable. The study was approved by the Gene Bandhu Independent Ethics Committee and all data were anonymized to ensure confidentiality.

AVAILABILITY OF DATA AND MATERIALS:
The datasets generated and/or analysed during the current study are available from the corresponding author on reasonable request.

COMPETING INTEREST: The authors declared no potential conflicts of interest with respect to the research, authorship, and publication of this article.

FUNDING STATEMENT
This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors.

AUTHOR CONTRIBUTIONS: All named authors met the International Committee of Medical Journal Editors (ICMJE) criteria for authorship of this article, took responsibility for the integrity of the work as a whole, and gave their approval for this version to be published.

ACKNOWLEDGEMENTS
All cases presented to NIVAAN – a chain of pain clinics in India. We thank the clinical and administrative staff of the pain management clinics for their support in patient care and data documentation. We are especially grateful to the patients and their families for their trust and willingness to share their experiences. Writing and editorial support for this manuscript was provided by the APAR Health team. All authors retained full control over the content and final approval of the manuscript.

REFRENCES

1. Kim IJ, Kim HA, Seo YI, Jung YO, Song YW, Jeong JY, et al. Prevalence of Knee Pain and Its Influence on Quality of Life and Physical Function in the Korean Elderly Population: A Community Based Cross-Sectional Study. J Korean Med Sci. 2011;26(9):1140.
2. World Health Organization. Musculoskeletal conditions. 2023.
3. Kishore J. Prevalence of Musculoskeletal Disorders Among Adult Population of India. Epidemiology International. 2019 Dec 6;04(03):22–6.
4. Kandasamy S, Vadivelu R, Shanmugam SK, Mahendran BS. Exploring the Burden of Knee Osteoarthritis in Rural South India: Community Prevalence, Risk Factors, and Functional Assessment Among Adults Aged 40 and Above. Cureus. 2024 Nov 11;
5. Qadeer AS, Meher A, Rachel J, Paulson W, Patra A, Gandhi N, et al. Economic Evaluation of Total Knee Replacement Compared with Non-Surgical Management for Knee Osteoarthritis in India. Pharmacoecon Open. 2025 Mar 2;9(2):217–29.
6. de Rooij M, van der Leeden M, Heymans MW, Holla JFM, Häkkinen A, Lems WF, et al. Prognosis of Pain and Physical Functioning in Patients With Knee Osteoarthritis: A Systematic Review and Meta-Analysis. Arthritis Care Res (Hoboken). 2016 Apr 24;68(4):481–92.
7. Urits I, Jones M, Patel R, Adamian L, Seifert D, Thompson W, et al. Minimally Invasive Interventional Management of Osteoarthritic Chronic Knee Pain. J Knee Surg. 2019 Jan 30;32(01):072–9.

8. Thati S. Gender Differences in Osteoarthritis of Knee. J Midlife Health. 2021 Jan;12(1):16–20.
9. Szilagyi IA, Waarsing JH, van Meurs JBJ, Bierma-Zeinstra SMA, Schiphof D. A systematic review of the sex differences in risk factors for knee osteoarthritis. Rheumatology. 2023 Jun 1;62(6):2037–47.
10. Faber BG, Macrae F, Jung M, Zucker BE, Beynon RA, Tobias JH. Sex differences in the radiographic and symptomatic prevalence of knee and hip osteoarthritis. Front Endocrinol (Lausanne). 2024 Oct 4;15.
11. Khanna V, Sharma R. Incidence of primary osteoarthritis knee below 40 years of age and its etiological factors: OPD survey of 200 knee pain patients. Indian Journal of Orthopedics Surgery. 2019 Apr 28;5(1):88–94.
12. Sharma AK, Tiwari SS, Dixit A. Early onset osteoarthritis knee in premature menopausal women. Int J Res Orthop. 2019 Oct 22;5(6):1140.
13. N. Acharya R, M. Patel H. Prevalence of the Knee Osteoarthritis Risk Factors Among Young Adult Population - An Observational Study. Int J Health Sci Res. 2023 Oct 5;13(10):158–63.
14. Pal CP, Singh P, Chaturvedi S, Pruthi KK, Vij A. Epidemiology of knee osteoarthritis in India and related factors. Indian J Orthop. 2016 Oct 1;50(5):518–22.
15. Aseem S, Khanam FM, Sufiyanuddin M, Yaseen MAM. Incidence density and relative rate assessment of knee osteoarthritis with respect to BMI, age and gender conducted in a tertiary care hospital in Hyderabad, India. Int J Community Med Public Health. 2023 Mar 29;10(4):1502–5.
16. Shabnam Joshi. Evaluation of Age, Gender, Body Mass Index and Gait Characteristics in Knee Osteoarthritis Patients. 2018 Aug;8(8):151–8.
17. Zheng H, Chen C. Body mass index and risk of knee osteoarthritis: systematic review and meta-analysis of prospective studies. BMJ Open. 2015 Dec 11;5(12):e007568.
18. Park D, Park YM, Ko SH, Hyun KS, Choi YH, Min DU, et al. Association of general and central obesity, and their changes with risk of knee osteoarthritis: a nationwide population-based cohort study. Sci Rep. 2023 Mar 7;13(1):3796.
19. Prachita Walankar. Pain, Functional Disability and Quality of Life in Knee Osteoarthritis. International Journal of Health Sciences and Research. 2018 Jul;8(7):177–81.
20. Sancheti P, Shetty VD, Dhillon MS, Sprague SA, Bhandari M. India-Based Knee Osteoarthritis Evaluation (iKare): A Multi-Centre Cross-Sectional Study on the Management of Knee Pain and Early Osteoarthritis in India. Clin Orthop Surg. 2017;9(3):286.