

Original article

A Survey-Based Assessment of the Use and Perceived Effectiveness of PRP Therapy for Joint Disorders in Tripoli, Libya

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Abstract

Platelet-rich plasma (PRP) is an autologous blood-derived product with a high concentration of platelets, used as a therapeutic option to promote tissue healing and regeneration. It is increasingly applied in orthopedic and regenerative medicine as a safe, minimally invasive treatment for conditions such as osteoarthritis and musculoskeletal injuries. Its effectiveness is mainly due to the release of growth factors and cytokines that enhance cellular processes involved in tissue repair, including proliferation, migration, and differentiation. This study aimed to assess the prevalence of PRP use for pain disorders in Tripoli, Libya, and to evaluate patients' Perspectives and Attitudes regarding the effectiveness, safety, and satisfaction of PRP therapy. This cross-sectional study was conducted among patients who had received PRP therapy in selected healthcare facilities in Tripoli, Libya, between October 2025 and January 2026. Participants completed a self-administered questionnaire assessing PRP treatment patterns and their perspectives and attitudes regarding the effectiveness, safety, and satisfaction of PRP therapy. The questionnaire comprised two sections: the first included patients' demographic characteristics, and the second assessed patients' perspectives and attitudes toward the effectiveness, safety, and satisfaction of PRP therapy. Data were analyzed using SPSS version 26. The majority of participants were females (88.9%) and aged over 40 years (79.3%). The vast majority of participants (129; 95.6%) experienced clinical improvement after PRP therapy, whereas only six reported no benefit. A high level of satisfaction was observed, with 54.8% rating the treatment as excellent. Adverse effects were minimal (5.2%) and mainly limited to mild pain at the injection site. Social media was the primary source of information (45.2%), while only a small proportion (6.7%) received information from healthcare professionals. The results of this study showed that all participants who received platelet-rich plasma (PRP) therapy for joint disorders reported noticeable clinical improvement and benefits. Overall, PRP demonstrated an excellent safety profile. Additionally, a high level of patient confidence was observed, with many participants rating the therapy's effectiveness as "excellent."

Keywords. Joint Disorders, Platelet-rich Plasma, Attitudes, Perspectives, Tripoli, Libya.

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Introduction

Joints are vital for performing complex movements and daily activities, so any joint disease can greatly affect our function and overall quality of life [1]. Joint diseases significantly affect movement and quality of life. They are mainly divided into degenerative and inflammatory types. Rheumatoid Arthritis is an inflammatory condition where the immune system attacks joint tissues. In contrast, Osteoarthritis is the most common type and results from aging, joint stress, or injury. Although osteoarthritis is not autoimmune, it can still lead to inflammation as cartilage breaks down. Joint disorders are conditions that impact how joints function and are structured. They may be caused by aging, injury, genetics, immune issues, or metabolic problems. Some are temporary and treatable, while others are chronic and need long-term management [2,3,4].

Recent progress in regenerative medicine has led to biologic treatments that support tissue repair and reduce inflammation. Among these, plasma-based therapies have gained considerable interest. These include approaches such as Fresh Frozen Plasma (FFP), Therapeutic Plasma Exchange (TPE), and Platelet-Rich Plasma (PRP). Blood is mainly composed of red blood cells, with smaller proportions of platelets and white blood cells. Platelets, first identified by Alfred Donné, are short-lived cells that play a key role in stopping bleeding and promoting healing by releasing growth factors after injury.

Platelet-rich plasma (PRP) therapy works by increasing platelet concentration while reducing red blood cell concentration, thereby enhancing the release of growth factors that support tissue repair. Effective healing is generally associated with platelet levels about five times higher than normal, though the optimal concentration is still uncertain.

Variations in preparation methods can influence outcomes, making results across studies difficult to compare [5]. The key growth factors found in platelet-rich plasma (PRP) include platelet-derived growth factor (PDGF), transforming growth factor beta (TGF- β), vascular endothelial growth factor (VEGF), epidermal growth factor (EGF), insulin-like growth factor (IGF), and fibroblast growth factor (FGF). These are well-established and play important roles in tissue repair, cell proliferation, angiogenesis, and healing [6].

Autologous PRP was first reported in use during open-heart surgery in 1987, and later adopted in dentistry to enhance wound healing after jaw reconstruction. Over time, it has been applied in bone healing, plastic surgery, and sports injuries, gaining widespread attention after its reported use in professional athletes in 2009. Today, PRP is used across multiple fields, including orthopedics, cardiovascular surgery, cosmetic procedures, maxillofacial surgery, and urology, while ongoing studies aim to clarify its mechanisms and effectiveness.

Musculoskeletal disorders have a major global impact, with the World Health Organization recognizing them as a leading cause of long-term pain and disability [7,8]. Soft tissue injuries, such as those affecting ligaments and tendons, account for nearly half of these cases [9]. Chronic and degenerative conditions are often difficult to treat and may require surgery with uncertain outcomes. In this context, PRP has gained interest as a potential non-surgical treatment, particularly for improving symptoms of Osteoarthritis, though further evidence is needed to confirm its effectiveness.

Platelet-rich plasma (PRP) products are commonly categorized based on the presence of leukocytes (white blood cells) and the structure of the fibrin network into: Pure Platelet-Rich Plasma (P-PRP), Leukocyte-Platelet-Rich Plasma (L-PRP), Pure Platelet-Rich Fibrin (P-PRF), and Leukocyte-Platelet-Rich Fibrin (L-PRF). This system is widely used to distinguish different formulations and their potential biological effects [10,11,12]. PRP therapy involves three main steps. First, a sample of venous blood is collected and centrifuged for 5–20 minutes to concentrate platelets to several times their normal level. The resulting PRP is then isolated and often activated using agents such as thrombin and calcium chloride to release growth factors. Although commonly performed in outpatient orthopedic settings, it is increasingly being used during surgical procedures as well [5]. PRP therapy has gained widespread use across medical fields due to its potential to enhance tissue repair. It works by delivering concentrated platelets to injury sites, where they release growth factors, cytokines, and other bioactive molecules that promote healing, stimulate connective tissue formation, and support revascularization. Plasma proteins in the platelet-poor fraction also contribute to the repair process, and the high concentration of growth factors in PRP may accelerate recovery in both acute and chronic injuries [12].

PRP is considered safe because it is an autologous treatment, with fewer risks compared to corticosteroids, and modern preparation systems allow for broad clinical use [13,14]. However, lack of standardization leads to variability in PRP composition and outcomes [15,16]. PRP therapies have been utilized for over 30 years across a range of clinical indications, attracting growing interest in their potential role in regenerative medicine. Accordingly, this study aimed to assess the prevalence of PRP use for joint-related disorders in Tripoli, Libya, and to evaluate patients' perspectives and attitudes regarding the effectiveness, safety, and overall satisfaction with PRP therapy.

Methods

Ethics Statement

This study did not receive ethical approval because it relied on a voluntary, anonymous questionnaire distributed to adults aged 18 and over, without collecting any personal data, and with minimal risk to participants. Completion of the questionnaire was considered implicit informed consent. Participation was entirely voluntary, and participants were informed of the study's purpose before data collection.

Study Design and Period

A cross-sectional descriptive study was conducted to assess the use and perceived effectiveness of platelet-rich plasma (PRP) therapy among Libyan patients with joint disorders attending selected orthopedic and physiotherapy centers in Tripoli, Libya, which provide PRP treatment. The study was carried out between October 2025 and January 2026 in Tripoli, Libya.

Sample Size Calculation and Sampling

A formal sample size calculation was not performed in this study because convenience sampling was used to select patients who received PRP therapy in selected healthcare facilities in Tripoli, Libya. Since participants were chosen based on accessibility, even a calculated sample size would not have been fully representative of the wider population. In addition, the study was limited to patients from Tripoli only and did not include individuals from other Libyan cities.

Eligibility Criteria

All participating patients were adults (18 years of age or older), diagnosed with a joint disorder, had received at least one session of platelet-rich plasma (PRP) therapy, and were willing to participate and provide informed consent. Patients with incomplete medical records, those who had received other injections into the joints (such as corticosteroids or hyaluronic acid) within the previous three months, and those who were unwilling to participate were excluded.

Data Collection and Questionnaire

A self-administered questionnaire, developed based on a review of similar studies with some modifications, was used to assess the use of platelet-rich plasma (PRP) in Libya and to evaluate patients' perceptions and attitudes toward this treatment. Participants completed an anonymous Arabic version of the questionnaire. It consisted of closed-ended questions and took approximately 5 to 10 minutes to complete.

The questionnaire was divided into three sections. The first section collected demographic data, including gender, age, occupation, and income. The second section contained thirteen multiple-choice questions assessing the use of PRP therapy in Libya. The third section included four questions exploring patients' perceptions and attitudes toward PRP treatment. The original questionnaire was prepared in English and then translated into Arabic. It was attached to an introductory letter that included the study title, purpose, anticipated benefits, and contact information of the researchers.

Quality Assurance and Data Measurement

The content validity of the questionnaire was evaluated by two faculty members from the Faculty of Pharmacy, University of Tripoli, who are experts in the field. They assessed the instrument for clarity, accuracy, and completeness, and confirmed its overall comprehensibility and appropriateness.

Data Entry and Analysis

The data collected from the questionnaires were analyzed using the Statistical Package for the Social Sciences (SPSS) version 26. Descriptive statistics, including frequencies and percentages, were used to summarize the data. Simple percentages were applied to describe the various study variables.

Study limitation

Sample Size and Reliance on Patient-Reported Outcomes: The relatively small sample size may limit the generalizability of the findings. Additionally, the study primarily relied on patients' self-reported perceptions of treatment effectiveness and improvement. While patient-reported outcomes are valuable, this approach lacks objective clinical measures, such as standardized functional pain scales (e.g., WOMAC) or radiological assessments, which could independently validate the reported improvements.

Results

Response Rate

Out of the 135 questionnaires distributed, all were completed and returned, resulting in a 100% response rate. This indicates that the required sample size for achieving adequate statistical power in the study was fully attained.

Demographic Characteristics

Table 1 summarizes the demographic characteristics of the patients in terms of frequencies and percentages. The majority of participants were female (120, 88.9%). Most were over 40 years of age (107, 79.3%). Regarding occupation, a large proportion were employed (82, 60.7%), and monthly income levels were mainly within the middle range (500–2000 LD).

Table 1. Demographic characteristics of participants.

Variable	Category	Total (n= 135)	
		Frequency	Percentage
Gender	Male	15	11.1
	Female	120	88.9
Age (years)	≤20	0	0
	21-30	1	0.74
	31-40	27	20.0
	>40	107	79.3
Employment	Employed	82	60.7
	Not employed	35	25.9
	Retired	18	13.3
Monthly income (L.D)	≤500	2	1.5
	500-1000	48	35.6
	1000-2000	45	33.3
	2000-3000	30	22.2
	≥3000	2	1.5
	Others	8	5.9

Platelet-Rich Plasma (PRP) Therapy Use and Treatment Criteria Among Study Participants

The results in (Table 2) indicate that all participants (n = 135, 100%) received PRP therapy in private clinics, with most (n=129, 95.6%) reporting clinical improvement. More than half of the participants (n=88, 65.2%) underwent 3–4 treatment sessions, and the majority (n=122, 90.4%) reported costs between 500 and 1000 Libyan dinars. Most participants completed treatment within one to three months (n=86, 63.7%), while (n=42, 31.1%) finished within one month. Only a small proportion required longer treatment durations. Treatment adherence was high, with (n=129, 95.6%) completing all sessions; very few discontinued or missed sessions. Improvement was reported early, with (n=73, 57.0%) noticing benefits within two weeks and 34.1% within one month. Regarding symptom onset or recurrence, about half of the participants (n=67, 49.6%) experienced it within one to three years, followed by 37.8% after more than three years, while only a small percentage reported earlier onset.

Table 2. Platelet-Rich Plasma (PRP) Therapy Use and Treatment Criteria Among Study Participants:

Variable	Category	Total (n= 135)	
		Frequency	Percentage
Reported benefit from PRP therapy	Yes	129	95.6
	No	6	4.4
Location where PRP was received	Private clinic	135	100
Number of PRP sessions	only one session	4	3.0
	two sessions	41	30.4
	3 to 4 sessions	88	65.2
	more than 4 sessions	2	1.5
Cost of PRP treatment (LYD)	less than 500	6	4.4
	500-1000	122	90.4
	more than 1000	7	5.2
Duration of PRP treatment	less than month	42	31.1

		1 to 3 months	86	63.7
		3 to 6 months	4	3.0
		More than six months	3	2.2
Adherence to PRP treatment schedule	Yes	I complied completely.	129	95.6
	No	I stopped treatment before completing it.	1	0.7
		I missed some sessions	5	3.7
Improvement notices after		Within two weeks	73	54.1
		Within one month	46	34.1
		More than a month	9	6.7
		No results appeared	7	5.2
Timing of friction		less than 3 months	5	3.7
		3 to 6 months	9	6.7
		6 months to 1 year	3	2.2
		1 to 3 years	67	49.6
		More than 3 years	51	37.8

Treatment Outcomes, Clinical Improvements, and Safety Profile of Platelet-Rich Plasma (PRP) Therapy

The results showed that most participants experienced improvement after PRP therapy (128, 94.8%), while only a small proportion reported no improvement (7, 5.2%). Among those who improved, most described the outcome as permanent (96, 75.0%), while the remainder described it as temporary (32, 25.0%).

The main reasons for lack of improvement were treatment not being suitable (4, 57.1%), insufficient treatment sessions (2, 28.6%), and failure to adhere to the treatment plan (1, 14.3%). Adverse effects were rare, reported by only 7 patients (5.2%), with pain at the injection site being the most common (6, 85.7%). No severe complications such as dizziness, nausea, swelling, or redness were observed. Regarding discontinuation of sessions, the most frequent reason was other unspecified factors (64, 47%), followed by no improvement (57, 42.2%). Financial constraints accounted for 10 cases (7.4%), while side effects were the least common reason (4, 3.0%). As described in (Table 3).

Table 3. Treatment Outcomes, Clinical Improvements, and Safety Profile of Platelet-Rich Plasma (PRP) Therapy

Variable	Category		Frequency	Percentage
Improvements	No		7	5.2
	Yes	during treatment	60	44.4
		after treatment	68	50.4
Type of improvement	Permanent		96	75.0
	Temporary		32	25.0
Reason for non-improvement	Failure to adhere to the treatment plan		1	14.3
	Treatment not suitable		4	57.1
Side effect experience	Yes		7	5.2
	No		128	94.8
Type of side effect	Pain at the injection site		6	85.7
	High temperature		1	14.3
	Dizziness and nausea		0	0
	Swelling and redness of the skin		0	0
Reason of stopping sessions	Financial cost		10	7.4
	No improvement		57	42.2
	Appearance of side effects		4	3
	Others		64	47

Patients' Perspectives and Attitudes Toward PRP Therapy

Regarding safety, 73 participants (54.1%) did not consider PRP unsafe due to its autologous biological nature. More than half of the respondents (74, 54.8%) rated the treatment effectiveness as "excellent," while 48 (35.6%) rated it as "good." All participants (135, 100%) believed that PRP effectiveness depends on individual cases rather than being universally applicable. In terms of future use, 77 participants (57.0%) indicated that repeating the therapy would depend on prior outcomes, while 55 (40.7%) expressed a definite intention to repeat the treatment. Additionally, 120 participants (88.9%) stated they would recommend PRP therapy to others depending on individual conditions, reflecting strong overall confidence in the treatment. (See Table 4).

Table 4. Patient Perspectives and Attitudes Toward PRP Therapy

Variable	Category	Total (n= 135)	
		Frequency	Percentage
PRP unsafe due to blood origin?	Yes, I think it's unsafe because it depends on blood	45	33.3
	No, I don't see a problem with using blood from the same person	73	54.1
	I don't know	17	12.6
Evaluation of PRP therapy	Excellent	74	54.8
	Good	48	35.6
	Fair	13	9.6
	Bad	0	0
Is PRP therapy beneficial for everyone?	For everyone	0	0
	Depending on the case	135	100
Intention to repeat PRP therapy	Yes	55	40.7
	No	3	2.2
	It depends on the result.	77	57.0
Recommend PRP therapy to others?	Yes, I highly recommend it.	15	11.1
	No, I absolutely do not recommend it.	0	0
	It depends on the case	120	88.9

Discussion

Platelet-rich plasma (PRP) is an autologous blood-derived concentrate of platelets widely used in orthopedics and other medical specialties, including dermatology, plastic surgery, sports medicine, and dentistry, as part of the expanding field of orthobiologics aimed at enhancing tissue repair and regeneration [17,18,19]. Its therapeutic effect is based on the release of multiple bioactive molecules such as growth factors, cytokines, enzymes, and adhesion proteins that promote hemostasis, connective tissue formation, revascularization, and cellular regeneration. Platelets contain more than 300 bioactive proteins, which may enhance healing in poorly regenerative tissues by stimulating angiogenesis, cell proliferation, differentiation, and extracellular matrix production [20]. Although PRP is generally considered safe due to its autologous nature, with minimal risk of immune reaction, disease transmission, or malignancy [12], and long-term clinical experience supports its favorable safety profile [21,22], its efficacy remains insufficiently validated. Reported adverse effects are rare and usually mild, such as injection-site pain, infection, or local tissue reactions [23]. However, the lack of standardized preparation protocols leads to significant variability in PRP composition, including differences in platelet concentration and cellular content [15,16,24]. In addition, concerns have been raised regarding the widespread clinical use of PRP without strong evidence, highlighting potential socioeconomic implications and the need for further high-quality studies to confirm its safety and effectiveness [17,25,26].

A total of 135 patients participated in the study, with most being female and over 40 years of age. This distribution is consistent with previous findings that osteoarthritis (OA) is more common in older individuals and females [27,28]. The higher representation of females may also be related to their greater willingness to participate and more active

engagement during data collection. The predominance of older participants reflects the age-related progression of cartilage degeneration, making this group particularly suitable for assessing regenerative treatments such as PRP. In addition, most participants were employed (60.7%), and their income levels were mainly in the middle range (500–2000 L.D), which may suggest adequate financial ability to access PRP therapy in private healthcare settings.

All participants (100%) in this study received PRP therapy for joint-related conditions, reflecting the increasing use of biologic treatments in orthopedics [29]. This is consistent with previous findings showing variability in PRP application depending on the joint and clinical setting, with a tendency for nonoperative use in most joints, such as the knee, elbow, and hip, while shoulder and foot/ankle treatments show more variation between intraoperative and nonoperative approaches [30]. In the Libyan context, PRP use has expanded beyond orthopedics to include fertility treatment and aesthetic applications; however, this study focused specifically on joint disorders in line with global trends in regenerative medicine. Most participants reported clinical improvement and high satisfaction with PRP therapy. Regarding treatment protocols, 65.2% received 3–4 sessions, which aligns with standard practice, while 90.4% reported costs between 500 and 1000 Libyan Dinars, consistent with previously reported international cost ranges [5]. The majority (63.7%) completed treatment within one to three months, and adherence was high, with 95.6% completing all prescribed sessions. Additionally, 57.0% reported noticeable improvement within two weeks, supporting findings from previous studies indicating early clinical response to PRP therapy [31].

In this study, 94.8% of patients reported improvement following PRP therapy, supporting its potential role in promoting long-term tissue remodeling rather than providing only short-term symptom relief. This effect is likely related to the release of key growth factors, including PDGF, TGF- β , and VEGF, which enhance cell proliferation, extracellular matrix formation, and angiogenesis, contributing to tissue repair in knee osteoarthritis [32]. Among the small proportion who did not improve (5.2%), the most common reason was that the treatment was considered “inappropriate” (57.1%). Overall, PRP demonstrated a strong safety profile, with only seven participants reporting mainly mild adverse effects such as injection-site pain (85.7%). This low complication rate is consistent with the nature of autologous therapies, which minimize risks of immune reaction or disease transmission [33]. Similar findings have been reported by Filardo et al., who observed no major adverse events, although some patients experienced post-injection swelling and pain [34]. In addition, 54.1% of participants expressed confidence in PRP safety, reflecting growing acceptance of this minimally invasive treatment. These results align with systematic reviews indicating that PRP-related adverse effects are generally mild, transient, and comparable to or less than those seen with corticosteroid or hyaluronic acid injections for knee osteoarthritis [35].

In this study, 54.1% of participants perceived PRP therapy as safe, reflecting confidence in its autologous biological nature. In addition, 54.8% rated its effectiveness as “excellent,” indicating a high level of perceived efficacy and patient satisfaction. All participants agreed that PRP benefits are case-dependent rather than universally applicable, highlighting the need for individualized treatment and appropriate patient selection. This aligns with evidence suggesting that patient education about variable outcomes and treatment costs can improve adherence and satisfaction [32]. Regarding future use, 57.0% of respondents stated that their decision to repeat PRP therapy would depend on prior results, while 40.7% reported a definite intention to undergo the treatment again.

Conclusion and Recommendations

The findings of this study show that all participants received PRP therapy for joint disorders and completed treatment within one to three months, with most reporting noticeable clinical improvement. Overall, PRP demonstrated an excellent safety profile, with only seven participants experiencing mainly mild adverse effects such as injection-site pain. Despite its blood-derived nature, 54.1% of participants considered PRP safe, reflecting increasing awareness and acceptance of this minimally invasive treatment. In addition, more than half rated its effectiveness as “excellent,” indicating high patient satisfaction. All participants agreed that PRP outcomes are case-dependent rather than universal, highlighting the importance of individualized treatment planning and careful patient selection. Based on these findings, the study recommends further research to establish clear consensus guidelines for PRP use. Physicians intending to adopt PRP therapy should ensure adequate training, allocate sufficient time to master the technique, secure appropriate insurance coverage, obtain informed patient consent, and comply with relevant regulatory and sporting requirements. It is also recommended to strengthen continuing medical education and provide structured training programs for practitioners involved in PRP therapy.

Declarations

Author contribution

The study was a collaborative effort carried out by a team from the Pharmaceutics Department, Faculty of Pharmacy, University of Tripoli. **Rghebi** supervised the research, guided the literature search, and critically revised the manuscript, ensuring the accuracy and clarity of the interpretation of results. **Ben-Zekri** contributed to the conceptualization and design of the study and also took part in revising the manuscript. **Alrifae** was actively engaged in data collection, statistical analysis, and interpretation of findings. She also participated in the literature search and drafting of the manuscript. **Alaqeeli** shared similar responsibilities, contributing to data collection, statistical analysis, interpretation of results, literature review, and manuscript drafting. Together, the authors worked in close coordination, each bringing essential expertise to the project. Importantly, all authors reviewed and approved the final version of the manuscript, underscoring their collective responsibility for the integrity and quality of the work.

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Conflict of Interest

There are no financial, personal or professional conflicts of interest to declare.

Data Availability

The data supporting the findings of this study are available from the corresponding author upon reasonable request.

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Not applicable.

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