

# KNOWLEDGE, ATTITUDES AND ACCEPTANCE OF PLATELET-RICH FIBRIN AMONG PATIENTS ATTENDING THE DEPARTMENT OF PERIODONTICS IN DENTAL UNIVERSITY HOSPITALS IN RIYADH, SAUDI ARABIA

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## Abstract

This study aims at assessing the knowledge, attitudes and acceptance of platelet-rich fibrin (PRF) among 519 adult patients who attended the Department of Periodontics of university dental hospitals in Riyadh, Saudi Arabia from January to March 2019, using a self-administered, online questionnaire of 15 questions. Descriptive statistics including frequencies and percentages was calculated for data analysis. Less than half of the respondents have heard about the PRF procedure and knew its benefits (25% and 46%, respectively). Around 50% of the respondents thought that it accelerates wound healing and regeneration but it is painful, while 60% would agree to perform PRF procedure when needed but would not recommend it to others. Thus, increasing patients' level of knowledge and attitudes about PRF applications in dentistry is advisable. It is recommended to dentists to inform their patients about the safety and benefits of PRF, and to involve them in decision making.

**Keywords:** *platelet-rich fibrin, patients' knowledge, patients' attitudes.*

## 1. INTRODUCTION

Over the last few decades, platelets were used in oral surgery to hasten wound healing and enhance tissue regeneration, as they contain growth factors essential for collagen production, vascular growth, in addition to cell mitosis, differentiation and recruitment to the wound site [1,2]. Recently, platelet concentrates, "a concentrated suspension of growth factors found in platelets" as stated by Kiran *et al.* [1], have been advocated in oral surgery and have shown promising results. The commonly used platelet concentrates are platelet-rich plasma (PRP) and platelet-rich fibrin (PRF) [1,3].

PRP, first introduced in dentistry by Whitman *et al.* [4], was reported to enhance osteoprogenitor cells of the host bone and bone graft [4,5]. However, the addition of bovine-derived thrombin to handle PRP may increase the risk of life-threatening coagulopathies [1,2,6]. In 2001, a novel change in the therapeutic evolution of platelets has been made by Dr. Choukroun and co-workers, the first to utilize PRF in oral surgery – so that it is now frequently named Choukroun's PRF [7]. PRF is a completely autologous fibrin membrane [8-10], acting as a reservoir of growth factors and cytokines [9] and combining fibrin sealant properties, thereby providing an ideal environment for wound healing and tissue regeneration [10]. PRF, the second-generation platelet concentrate, has numerous advantages. It can be easily prepared from patient's own blood and handled without adding any anticoagulant or other exogenous compounds, hence reducing the biochemical handling of blood and the risk of coagulopathies [1-3,6,11-13]. Compared to the natural blood clot, PRF is more homogeneous, more stable and easily handled when placed in the indicated site [14]. Furthermore, adding PRF to some bone grafts has been shown to enhance bone growth and maturation and to improve handling, stabilization and adaptation of bone grafts into the defect sites [2,15]. Due to its definitive post-surgical resorption, PRF is considered highly beneficial for patients, since it eliminates the need for a second surgery [11].

Nowadays, PRF is widely used in different fields of dentistry with promising results [3,12,16-18]. In periodontics, PRF has been reported as effective in treating mandibular class II furcations [19] and infrabony defects [20]. In addition, review studies reported that PRF has been used successfully in patients with gingival recessions, combined periodontic endodontic lesions, guided bone regeneration, sinus lift procedures and regenerative pulpotomies [2,21].

Despite the above-mentioned advantages, PRF also has several disadvantages. PRF protocol is influenced by the collection time and transmission for the centrifuge [8]. Furthermore, it requires using a glass-coated tube to achieve clot polymerization [22] and a puncture for blood collection, that might cause patient's discomfort or pain [23]. Decision-making in dentistry involves patients' preferences, values and cost considerations. Therefore, it is important to assess patients' knowledge on the biomaterials indicated for various dental treatment procedures. Scientific data on patients' acceptance and attitudes towards PRF is scarce. Therefore, the aim of the present study was to assess patients' knowledge, attitudes and acceptance of PRF for periodontal therapy.

## **2. MATERIALS AND METHODS**

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A cross-sectional, questionnaire-based study was conducted among 519 patients who attended the periodontal clinics at the dental university hospitals in Riyadh, Saudi Arabia, over a period of three months (January - March 2019). The criteria for inclusion were patients (males / females) older than 18 years, Arabic readers, free of any mental or physical disabilities, fully or partially dentated, and having internet access.

The study protocol was reviewed by the Institutional Ethical Committee of Riyadh Elm University and approval was obtained with reference number RC/IRB/2018/1578. Prior to participation in the study and for ethical clearance, a written informed consent was obtained from all participants, and confidentiality of the obtained information was granted. All

responses were reported anonymously and voluntarily.

A self-administered questionnaire was developed and tested among a random sample of periodontists and patients to ensure validity, practicability, and interpretation of responses. The questionnaire was first written in English, then translated into Arabic by a local interpreter, and again translated back into English by another interpreter, in order to avoid misinterpretation.

A self-administered, close-ended, online questionnaire (Appendix A) was used for data collection. It included 15 questions on sociodemographic characteristics (gender, age, and education level), knowledge, attitudes, and acceptance towards PRF and its applications.

The collected data was entered in Microsoft Office Excel and analyzed using Statistical Package for Social Sciences version 20. Descriptive statistics including frequencies and percentages was calculated to summarize participants' sociodemographic characteristics, their levels of knowledge, attitudes, and acceptance scores.

### **Appendix A. The questionnaire**

Knowledge, Attitude, and Acceptance of Platelet-Rich Fibrin among Patients Attending the Department Of Periodontics in Dental University Hospitals in Riyadh, Saudi Arabia

Platelet-rich fibrin (PRF) belongs to a new generation of platelet concentrates, like platelet-rich plasm, applied as plasma injections and used for hair or facial treatments. PRF consists of high concentrations of white blood cells, fibrin, and small amounts of stem cells present in the bloodstream. It is used in many fields of dentistry as it enhances the regeneration of damaged tissues and accelerates wound healing.

PRF is created immediately after a blood sample is collected from the body through an injection in the arm. Later on, the blood collected in a tube is placed in a machine that filters the blood cells and platelets. It appears to be a safe procedure as it is autologous (obtained from the same individual).

1. Gender  
Male  
Female
2. Age  
Under 18 years  
18-30 years  
31-40 years  
41-50 years  
51+ years
3. Education  
High school / less  
University  
Higher education
4. Have you ever used plasma in facial or hair treatment?  
Yes  
No
5. Have you ever heard of platelet-rich fibrin (PRF)?  
Yes  
No
6. If yes, how did you know about it?  
Social media  
Family  
Your doctor  
Other
7. Did you know that the procedure is simple and fast?  
Yes  
No
8. Did you know that PRF is cost effective?  
Yes  
No
9. Did you know that PRF requires collecting a small amount of your blood?  
Yes  
No
10. Did you know that PRF does not require a second surgery?  
Yes  
No
11. Do you think the procedure is painful?  
Yes  
No
12. Do you think that PRF accelerates wound healing and promotes tissue regeneration?  
Yes  
No
13. Do you think the procedure is performed routinely in dental clinics?  
Yes  
No
14. Would you accept to perform the procedure if it is needed?  
Yes  
No
15. Would you recommend the procedure to others?  
Yes  
No

### 3. RESULTS

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Out of the 519 participants, 156 (30.1%) were males and 363 (69.9%) were females. Majority of them were younger than 30 years (82.1%), and most of them had university education (90.4%) (Table 1).

The knowledge of respondents about PRF is shown in Table 2. Among all study subjects (n=519) who responded to the question whether they had ever heard of PRF, 385 (74.2%) participants answered „No”, while only 134 (25.8%) respondents answered “Yes”. The main source of participants’ information about PRF was families (47%), followed by doctors (30.6%), then social media (16.4%). Nearly 46% of the respondents knew that the PRF procedure is

simple and fast (45.7%), cost effective (46.1%), and entails second surgery (46.1%). However, 50.5% of the patients realized that it requires collecting blood sample.

Regarding the attitudes towards the PRF procedure, 260 (50.1%) assumed that it is not painful and they believed that it accelerates wound healing and promotes tissue regeneration, while 221 (42.6%) did not believe that PRF is performed routinely in dental clinics (Table 2).

Considering the experience, some respondents (46.6%) had undergone plasma treatment for face or hair (data not shown). Although 317 participants (60%) agreed to perform the PRF procedure if needed, they would not recommend it to others.

**Table 1. Distribution of participants by demographic characteristic**

Sociodemographic characteristic	Frequency	Percentage (%)
Gender		
Males	156	30.1
Females	363	69.9
Age (years)		
18 - 30	426	82.1
31 - 40	52	10.2
41 - 50	37	7.13
≥ 51	4	0.77
Education level		
High school/less	36	6.9
University	469	90.4
Higher education	14	2.7

**Table 2. Knowledge, attitudes, and acceptance of PRF and its applications among study respondents, by frequency and percentage of total respondents to each item**

Item (N = 519 respondents)	Response	Frequency	Percentage (%)
<b>I- Knowledge</b>			
I.1. Have you ever heard of PRF?	Yes	134	25.8
	No	385	74.2
I.2. If yes, how did you know about it?	Family	63	47.0
	Doctor	41	30.6
	Social media	22	16.4
	Others	8	6.0
I.3. Did you know that the PRF procedure is simple and fast?	Yes	237	45.7
	No	282	54.3
I.4. Did you know that PRF is cost effective?	Yes	239	46.1
	No	280	53.9
I.5. Did you know that PRF procedure requires collecting a small amount of your blood?	Yes	262	50.5
	No	257	49.5
I.6. Did you know that PRF procedure does not require a second surgery?	Yes	239	46.1
	No	298	57.4
<b>II-Attitudes</b>			
II.1. Do you think that the PRF procedure is painful?	Yes	259	49.9
	No	260	50.1
II.2. Do you think that PRF accelerates wound healing and promotes tissue regeneration?	Yes	260	50.1
	No	259	49.9
II.3. Did you think that the PRF procedure is performed routinely in dental clinic?	Yes	221	42.6
	No	298	57.4
<b>III- Acceptance</b>			
III.1. Would you accept to perform the PRF procedure if needed?	Yes	317	61.1
	No	202	38.9
III.2. Would you recommend the PRF procedure to others?	Yes	201	38.7
	No	318	61.3

#### 4. DISCUSSION

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The PRF therapeutic procedure is considered a minimally invasive technique with low risks and high satisfactory clinical outcomes [3,11,24,25], utilized frequently in many fields of dental surgeries, such as bone augmentation, gingival recession, and regenerative pulpotomies [2,21]. However, data on the assessment of patients' knowledge, attitude, and acceptance of PRF is missing. The present study is a descriptive, questionnaire-based, and cross-sectional survey that took place among 519 adult patients in Riyadh, Saudi Arabia.

The observation that many respondents never heard about PRF (74.2%) and around half of them did not know that its application in oral surgery is a simple, fast, cost effective (54%) and does not require second surgery (57%), reflects their misleading information. Almost half of the participants, received PRF information from their families, followed by doctors, then social media. This could be attributed to the popularity of PRF in athletes and celebrities. Rachul *et al.* [26] reported that the media coverage of PRP appeared to be the main source of information, due to the impact of elite athletes and celebrities, possibly leading to public misunderstandings of its efficacy and usage. Suprakash and his co-workers [27] mentioned that dentists were the main source of information about dental implants. Thus, it is advisable that dentists share information about the clinical applications and advantages of PRF.

Regarding patients' attitudes toward PRF, almost half of them agreed that PRF accelerates wound healing and promotes tissue regeneration. Similarly, Lee [28] stated that many professional athletes have turned to PRP injections to speed their recovery and return to sport, indicating that PRP injection is known and commonly used by athletes for treating sports injuries. More than half of the participants (61%) were willing to perform the procedure if needed. Correspondingly, 89.6% of subjects from six geopolitical zones of Nigeria accepted placement of dental implants only if tools, materials and well-trained practitioners were available [29]. Equally, 61% of the patients surveyed by Hof *et*

*al.* in 2014 [30] were willing to undergo autologous bone graft surgery for dental implants, and only 43% of them opted for bone substitute materials to avoid donor site surgery [30]. However, some patients might not choose autogenous tissue for their treatment. Better acceptance was observed with the cellular dermal matrix compared to subepithelial connective tissue graft in the treatment of buccal gingival recessions in terms of surgical time and post-operative pain.

Most clinicians make their decisions based on their experience and areas of expertise. However, it is advisable to involve patients in decision making. Therefore, patient's opinion and preferences must be considered before implementing any treatment.

#### 5. CONCLUSIONS

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In this study, participants' knowledge, attitudes, and acceptance towards PRF dental applications was below the average, although 46.6% of them have used plasma for facial or hair treatment. The source of information about PRF seems to affect patient's knowledge and attitudes towards it. Decision making in dentistry involves patients' knowledge, preferences and values, as well as cost considerations. Thus, it is necessary for the patient to be well informed about PRF by their dentists who must carefully consider the risks, costs and benefits of the type of platelet concentrate to be used for achieving the desired treatment outcomes.

To the best of our knowledge, the present survey is the first to investigate patient's knowledge and attitude on PRF, even if it is limited to patients visiting the Department of Periodontics at dental university hospitals in Riyadh. Future multicenter studies involving patients from different regions of Saudi Arabia with larger sample size, and a standardized questionnaire with higher level of evidence are recommended.

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