

# AWARENESS AND PERCEPTION OF PLATELET RICH PLASMA AMONG HEALTHCARE WORKERS IN A TERTIARY CARE CENTRE

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## Abstract

**Introduction:** Platelet rich plasma (PRP) is the autologous preparation of platelets in condensed plasma. Platelet rich plasma therapy has established its role in the field of dermatology. **Materials and Methods:** Cross-sectional prospective study among 100 healthcare workers from various departments regarding awareness of platelet rich plasma was collected using a questionnaire. **Results:** 90(90%) of them were aware of the term PRP. Only 70(70%) participants were aware of the uses of PRP in the field of dermatology. Only 71(71%) participants thought that PRP to be a safe procedure. **Discussion and Conclusions:** Creating awareness of the safety profile of the procedure is necessary to utilize the various advantages of using PRP in medicine.

**Keywords:** Platelet Rich Plasma, Awareness, Perspective.

## INTRODUCTION

Platelet rich plasma (PRP) is the autologous preparation of platelets in condensed plasma.<sup>[1]</sup> PRP contains more than 20 growth factors including platelet-derived growth factors transforming GF- $\beta$  vascular endothelial GF and insulin-like GF.<sup>[1,2]</sup> Various applications of platelet rich plasma in the field of dermatology includes its use in treating hair loss, acne scar treatment, skin rejuvenation, dermal augmentation, and striae distensae. <sup>[3]</sup> PRP can be combined with other therapies such as microneedling, lasers, dermal fillers etc. for improved aesthetic results. <sup>[3,4]</sup> PRP therapy has established its role in the field of dermatology, which inspired us to research on the awareness of PRP among healthcare professionals.

## Objectives

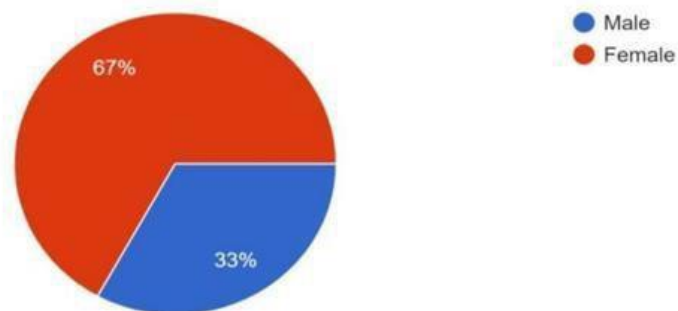
To assess the knowledge and awareness of platelet rich plasma among healthcare workers.

## MATERIALS AND METHODS

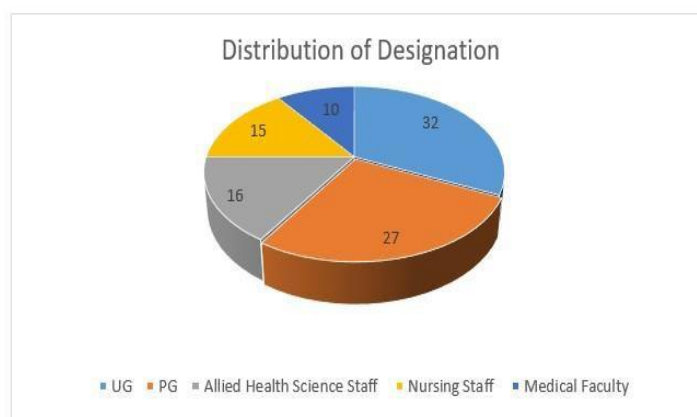
A cross-sectional prospective study was undertaken at the Department of Dermatology in a tertiary care centre among 100 healthcare workers from various departments. The data regarding awareness of platelet rich plasma was collected using a questionnaire between September 2022 and October 2022, after obtaining ethical clearance from the ethical committee of the hospital. Health care workers above 18 years of age, both males and females were selected by a simple random sampling method and informed consent was obtained from each participant. Questionnaires were distributed to 100 health care workers and statistical analysis was done on the collected data.

## RESULTS

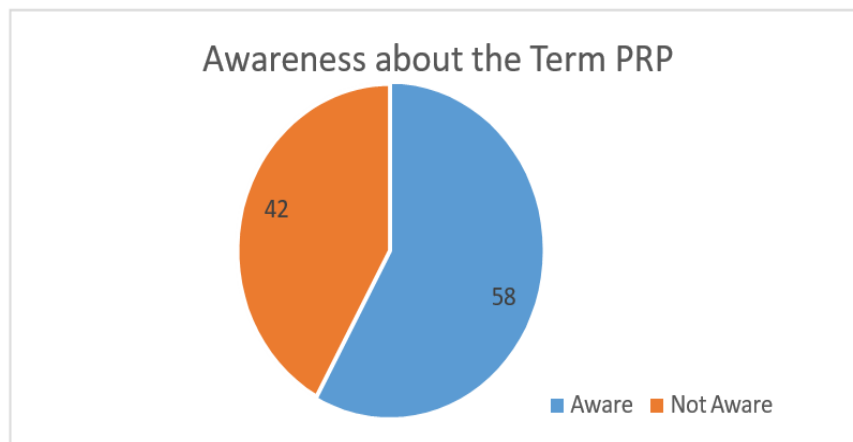
A total of 100 participants were enrolled for the study. The mean age of study participants was  $22.6 \pm 4.21$  years. The minimum and maximum age group ranged from 18-37 years. Among them, 67 (67%) were females, which was the majority and 33(33%) were males. Out of the 100 participants, 32 (32%) were medical under -graduate students followed by medical post-graduate students 27(27%), Allied health science students 16(16%), nursing staffs 15 (15%), Medical faculty 10(10%). In the present study, out of all participants, 58 (58%) of them were aware of the term PRP (i.e., platelet rich plasma) whereas 42(42%) were not aware of the term. It was noted that 44 (44%) were aware of the components of PRP. Regarding the use of PRP in dermatology, only 50(50%) participants were aware of the same. 40 (40%) participants were aware of the use in other fields of medicine as well. 38(38%) participants were aware of the mechanism of action of PRP, while 62(62%) were unaware. Only 33(33%) participants were aware about the steps to prepare PRP. 28(28%) participants were aware of the instruments used for the preparation of PRP. 30(30%) participants were aware about how to apply PRP on patients. Only 45(45%) participants thought that PRP is a safe procedure. 37(37%) participants were willing to undergo PRP themselves or recommend it to a friend or relative. 53(53%) participants were aware of the benefits of PRP in hair growth.



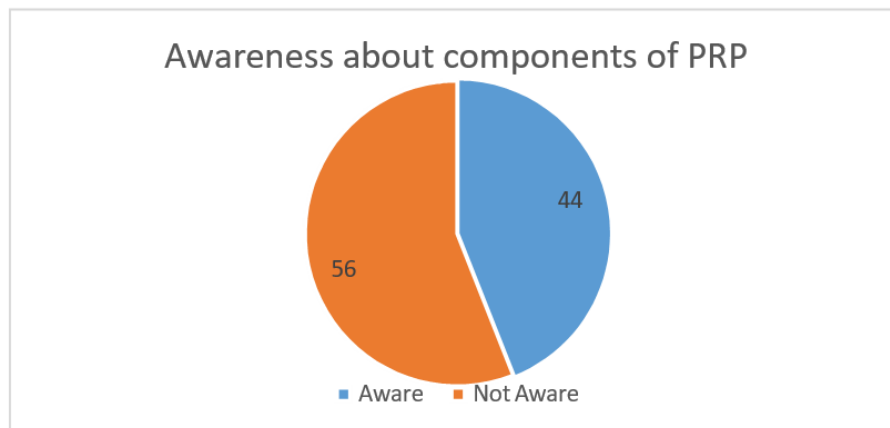
**Figure 1: Pie chart showing percentage distribution of the population according to gender participated in the study. 67% were females (RED) whereas only 33% males (BLUE) participated in the study. N=100. Females have participated in higher numbers in this survey.**



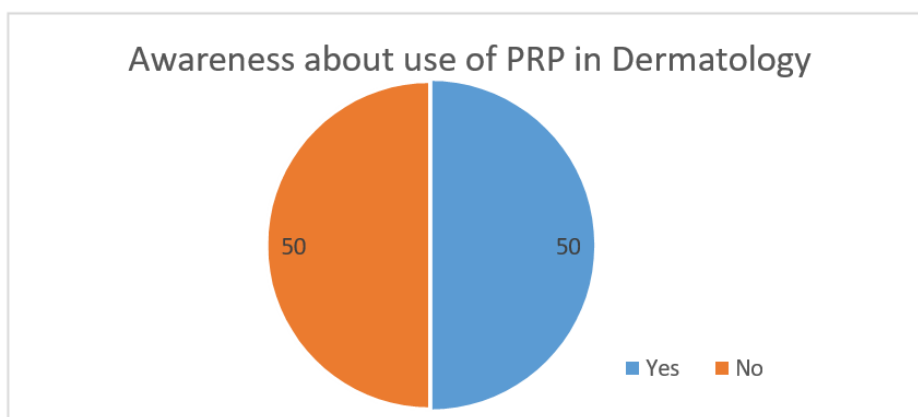
**Figure 2: Pie chart showing percentage distribution of the population according to DESIGNATION participated in the study. 27% were postgraduates in this survey. N=100.**



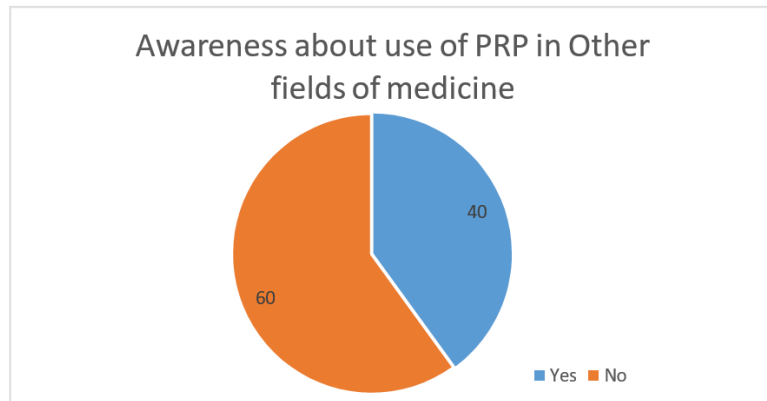
**Figure 3: Pie chart showing percentage distribution of the awareness of the term Platelet rich plasma among the participants participated in the study. 58% were aware of the term (Blue) whereas 42 %were not aware of the term(red). N=100.**



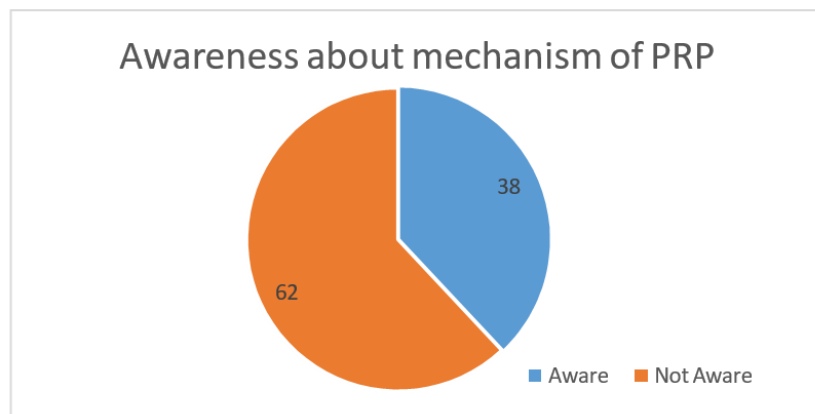
**Figure 4: Pie chart showing percentage distribution of the awareness of the components of Platelet rich plasma among the participants participated in the study. 44% were aware (Blue) whereas 56% were not aware of the components(red). N=100.**



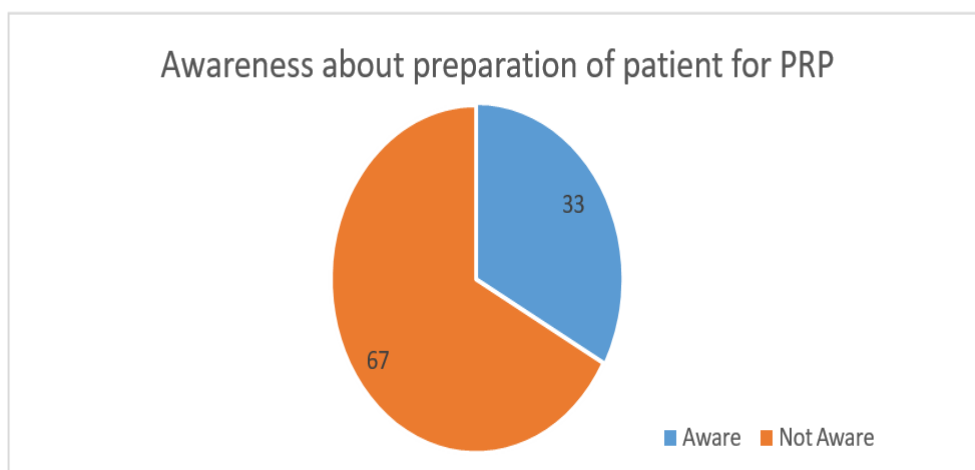
**Figure 5: Pie chart showing percentage distribution of the awareness of the application of Platelet rich plasma in dermatology. 50%(blue) of the population opted yes. N=100.**



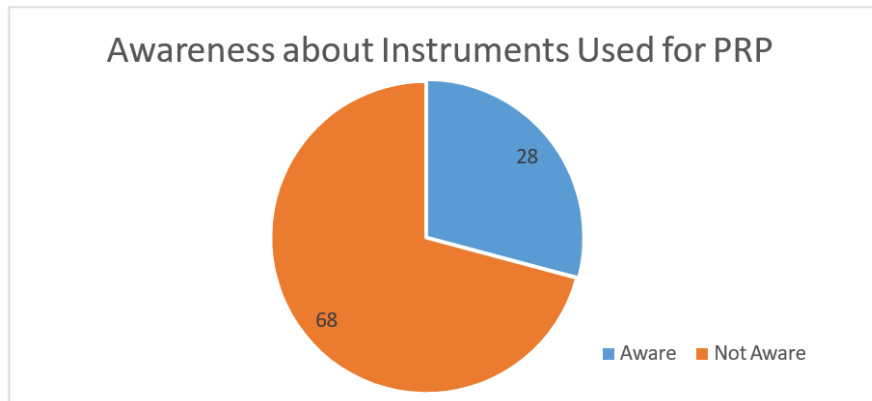
**Figure 6: Pie chart showing percentage distribution of the awareness of the application of Platelet rich plasma in other fields of medicine. 40%(blue) of the population opted yes followed by no by 60%(red) N=100.**



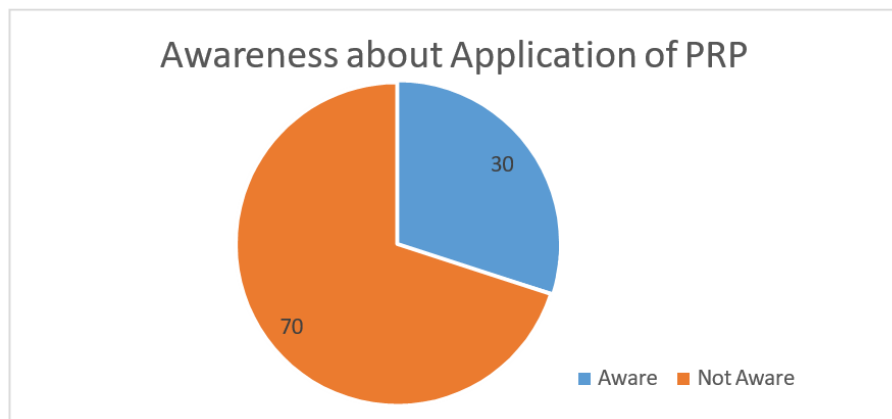
**Figure 7: Pie chart showing percentage distribution of the awareness of the mechanism of action of Platelet rich plasma among the participants participated in the study. 38% were aware of the term (Blue) whereas 62% were not aware of the mechanism of action (red). N=100.**



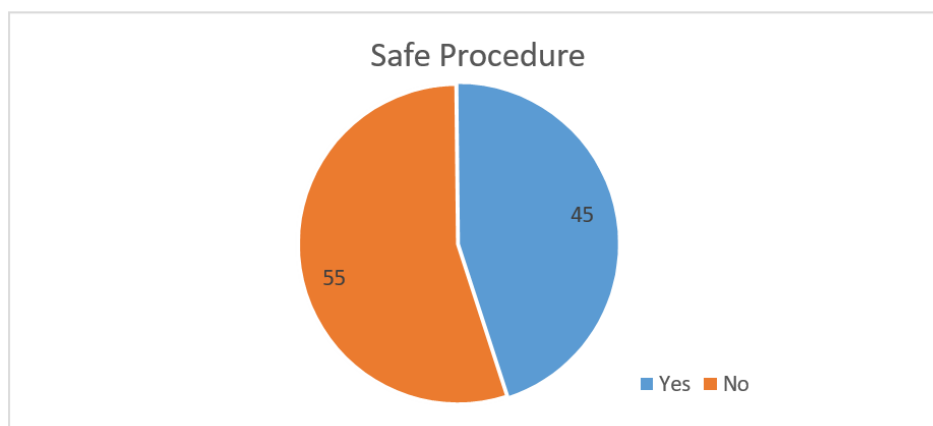
**Figure 8: Pie chart showing percentage distribution of the awareness of the method of preparation of Platelet rich plasma. 33%(Blue) of the population were aware about the proper protocol for preparation of platelet rich plasma and 67%(red) were unaware. N=100.**



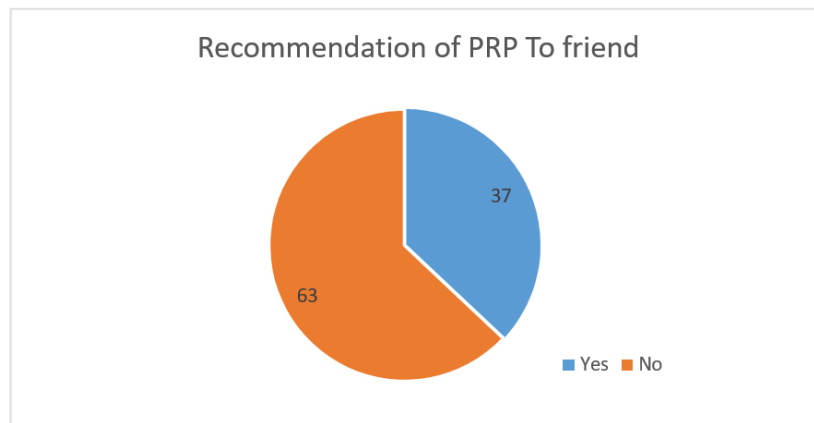
**Figure 9: Pie chart showing percentage distribution of the awareness of the instrument of preparation of Platelet rich plasma. 28%(Blue) of the population were aware about the instrument used for preparation of platelet rich plasma and 68%(red) of the population were unaware.N=100.**



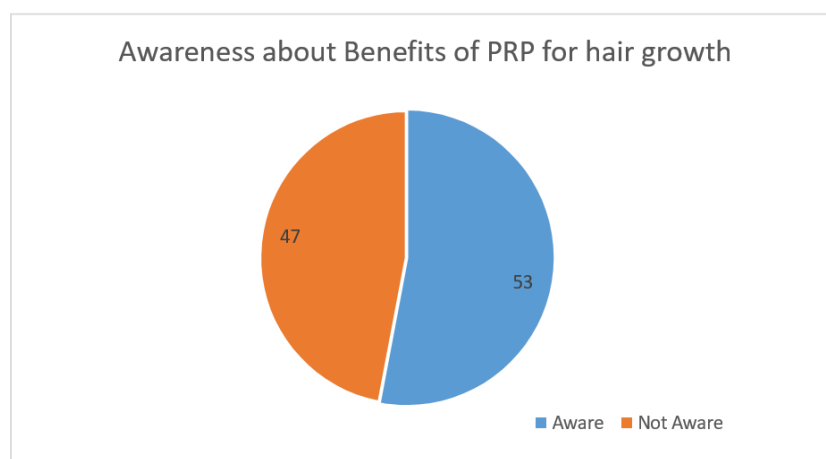
**Figure 10: Pie chart showing percentage distribution of the awareness about how to apply Platelet rich plasma. 30%(Blue) of the population were aware about how to apply platelet rich plasma 70%(red) of the population had no idea about how to apply platelet rich plasma. N=100.**



**Figure 11: Pie chart showing percentage distribution of the awareness whether Platelet rich plasma is a safe procedure 45%(Blue) of the population opted yes and 55%(red) of the population opted no. N=100.**



**Figure 12: Pie chart showing percentage of people willing to undergo Platelet rich Plasma themselves/recommend a friend. 37%(Blue) of the population were aware opted yes and 63%(red) of the population opted no N=100**



**Figure 13: Pie chart showing percentage distribution of the awareness of benefits of Platelet rich plasma in hair growth, among the participants participated in the study 53% were aware of the term (Blue) whereas 47% were not aware of benefits of Platelet rich plasma in hair growth (red). N=100.**

## DISCUSSION

Our study was focused on studying the awareness and perception of PRP among healthcare workers. Kingsley et al. First described the term platelet rich plasma in 1954.<sup>[5]</sup> Platelet rich plasma has become a prominent therapy for various conditions in alopecia treatment, aesthetic medicine and regenerative medicine <sup>[6]</sup>

In the present study, the majority (90%) were aware of the term PRP. Whereas a study conducted among dental students showed that only 59.3% were aware of PRP<sup>[7]</sup>. This difference might be attributed to the different study population. A study done among oral surgeons reported higher awareness of 93% which was similar to our study. <sup>[8]</sup>

In our study, only 70(70%) participants were aware of the application of PRP in the field of dermatology. Platelet rich plasma has various applications in the field of dermatology including the treatment of androgenic alopecia, alopecia areata, pigmentary disorders, scar revisions, lichen sclerosus, psoriasis and skin rejuvenation. <sup>[9,10]</sup> This diverse application of PRP can be attributed to the renowned innate healing

potential of supraphysiologic concentration of platelets.<sup>[10]</sup>

In androgenetic alopecia, growth factors from platelets act on stem cells found in the bulge area of the follicles, promoting the formation of new follicles and stimulating neovascularization. They promote the growth and transdifferentiation of hair and stem cells. The proliferation of dermal papillary cells is promoted, and its apoptosis is prevented by activated PRP. PRP was proven to substantially boost hair regeneration and minimize hair dystrophy in patients with alopecia areata.<sup>[11]</sup>

PRP decreases erythema and edema while simultaneously improving skin elasticity and boosting collagen in the treatment of acne scars, traumatic scars and striae distensae. When combined with laser treatments, microneedling, hyaluronic acid fillers and autologous fat grafting, PRP is useful in skin rejuvenation.<sup>[4]</sup> Apart from dermatology, PRP also has promising applications in the field of orthopedics and gynecology.<sup>[12,13]</sup>

Platelets contain  $\alpha$ -granules which store an abundance of growth factors (GFs). The action of PRP is through the presence of GFs and bioactive molecules which causes proliferation, migration, cell differentiation, and angiogenesis in the targeted area. PRP induces dermal papillae cells by activating ERK and Akt signaling, leading to antiapoptotic effects. It also increased the  $\beta$ -catenin activity and FGF-7 expression in DP cells, thus prolonging the anagen phase.<sup>[14]</sup>

The following steps are involved in the manufacture of platelet-rich plasma (PRP): (1) Whole blood is taken into a tube with anticoagulant. (2) The entire blood is divided into three layers following the first spin (soft spin). (3) When leukocyte-rich PRP is sought, the entire buffy coat with the lower plasma layer is collected and centrifuged, as opposed to just the most superficial buffy coat with the lower plasma layer when pure PRP is desired (second spin, hard spin). (4) Platelet-poor plasma (PPP) is removed, and suspended PRP is activated before injection.<sup>[4,11]</sup>

Based on the concentration of white blood cells, PRP is further divided into leukocyte-rich (LR)-PRP, leukocyte-poor (LP)-PRP, and pure-PRP.<sup>[15]</sup>

Only 71(71%) participants of our study considered PRP to be a safe procedure. This speaks to the need for creating awareness about the safety profile of the procedure, despite it having claimed its place in medicine for its vast applications and well-known effectiveness.

## CONCLUSION

PRP therapy has established its role in the field of dermatology, which inspired us to research on the awareness of PRP among healthcare professionals.

### Financial support and sponsorship

Nil

### Conflicts of interest

There are no conflicts of interest.

## References

- 1) Everts P, Onishi K, Jayaram P, Lana JF, Mautner K. Platelet-Rich Plasma: New Performance Understandings and Therapeutic Considerations in 2020. *Int J Mol Sci.* 2020 Oct 21;21(20):7794. doi: 10.3390/ijms21207794. PMID: 33096812; PMCID: PMC7589810.
- 2) Mussano, F., Genova, T., Munaron, L., Petrillo, S., Erovigni, F., & Carossa, S. (2016). Cytokine, chemokine, and growth factor profile of platelet-rich plasma. *Platelets*, 27(5), 467–471. doi:10.3109/09537104.2016.1143922
- 3) Nanda S, Chauhan K, Shetty V, Dashore S, Bhatia S. Platelet-Rich Plasma in Aesthetics. *Indian Dermatol Online J.* 2021 Nov 25;12(Suppl 1):S41-S54. doi: 10.4103/idoj.idoj\_290\_21. PMID: 34976880; PMCID: PMC8664171.
- 4) Emer J. Platelet-Rich Plasma (PRP): Current Applications in Dermatology. *Skin Therapy Lett.* 2019 Sep;24(5):1-6. PMID: 31584784.
- 5) Hurjui I, Delianu C, Hurjui Loredana L, et al. Platelet derivatives with dental medicine applications. *J Oral Rehabil.* 2020;12:142-152.
- 6) Paichitrojjana A, Paichitrojjana A. Platelet Rich Plasma and Its Use in Hair Regrowth: A Review. *Drug Des Devel Ther.* 2022 Mar 10;16:635-645. doi: 10.2147/DDDT.S356858. PMID: 35300222; PMCID: PMC8922312.
- 7) Hemashree J<sup>1</sup>, Dhanraj Ganapathy<sup>2</sup>, Revathi Duraisamy<sup>3</sup>. Awareness on Platelet Rich Plasma Among Dental Students – A Survey. *Biosc.Biotech.Res.Comm. Special Issue Vol 13 No 7(1) 2020* Pp-34-41
- 8) Stephen S, Ramar S, Rajendran C, Devar NM, Shaga IB, Somasundaram R, et al. Assessment of knowledge, awareness, and perception of platelet-rich plasma among oral surgeons. *J Pharm Bioall Sci* 2022; 14:S693-7.
- 9) Lin MY, Lin CS, Hu S, Chung WH. Progress in the use of platelet-rich plasma in aesthetic and medical dermatology. *The Journal of clinical and aesthetic dermatology.* 2020 Aug;13(8):28.
- 10) White C, Brahs A, Dorton D, Witfill K. Platelet-Rich Plasma: A Comprehensive Review of Emerging Applications in Medical and Aesthetic Dermatology. *J Clin Aesthet Dermatol.* 2021 Nov;14(11):44-57. PMID: 34980960; PMCID: PMC8675348.
- 11) Suruchi G, Shweta M, Chandi G. The wonder tool platelet rich plasma in cosmetic dermatology, trichology and hair transplant. *InDermatologic Surgery and Procedures* 2018 Feb 28. IntechOpen.
- 12) Everts PA, van Erp A, DeSimone A, Cohen DS, Gardner RD. Platelet Rich Plasma in Orthopedic Surgical Medicine. *Platelets.* 2021 Feb 17;32(2):163-74.
- 13) Varghese J, Acharya N. Platelet-Rich Plasma: A Promising Regenerative Therapy in Gynecological Disorders. *Cureus.* 2022 Sep 10;14(9).
- 14) Alves R, Grimalt R. A Review of Platelet-Rich Plasma: History, Biology, Mechanism of Action, and Classification. *Skin Appendage Disord.* 2018 Jan;4(1):18-24. doi: 10.1159/000477353. Epub 2017 Jul 6. PMID: 29457008; PMCID: PMC5806188.
- 15) Wakayama T, Saita Y, Kobayashi Y, Nishio H, Uchino S, Fukusato S, Ikeda H, Kaneko K. Quality comparison between two different types of platelet-rich plasma for knee osteoarthritis. *Regen Med Res.* 2020; 8:3. doi: 10.1051/rmr/200002. Epub 2020 Dec 3. PMID: 33287956; PMCID: PMC7721479.