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Knowledge & Awareness of PRF and its Newer Trends in Periodontics - A Survey

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Abstract: ***Platelet-Rich Fibrin (PRF), recognized as a second-generation platelet concentrate due to its biocompatibility and prolonged release of growth factors, has gained significant relevance in the field of periodontal regeneration. Nevertheless, the level of understanding regarding its preparation methods and the various evolving forms remains inconsistent among dental practitioners. This descriptive cross-sectional study, carried out from August to October 2025 with 100 participants utilizing a structured, pre-validated questionnaire, evaluated the knowledge and awareness of PRF and its contemporary trends in periodontics, with the data being analyzed through frequency and percentage distributions. The findings indicated that while a majority of participants (79%) accurately identified PRF as a second-generation derivative, and 65% acknowledged advanced variants such as L-PRF, A-PRF, i-PRF, and T-PRF, practical challenges—including financial constraints and insufficient equipment—limited its clinical application. In summary, despite a satisfactory level of theoretical knowledge, the restricted clinical implementation underscores the necessity for organized training programs and the integration of this subject into the curriculum to improve practical skills.***

Keywords: Platelet-Rich Fibrin, Awareness, Periodontics, Regenerative Dentistry, Dental Students.

I. INTRODUCTION

Platelet concentrates (PC), encompassing platelet-rich plasma (PRP) and platelet-rich fibrin (PRF), have become integral to surgical procedures across both medical and dental specialties, with their main purpose being the isolation and utilization of blood components that enhance healing and stimulate tissue regeneration (1). Although both leukocyte-rich and leukocyte-poor PRP variants have been widely studied, the specific role of non-platelet components within these concentrates remains insufficiently understood (1). Since the first description of platelet concentrates in 1954, continuous innovations have led to the development of advanced generations such as T-PRF, A-PRF, and i-PRF, each with unique biological and clinical properties (2,3). These formulations have demonstrated significant applications in periodontics and implant dentistry; however, differences in preparation techniques such as centrifugation parameters, transfer timing, equipment temperature, and handling often contribute to inconsistent outcomes reported in the literature (3,4). Furthermore, a lack of standardized terminology and classification in earlier years led to confusion, with various countries and commercial brands using differing names for similar products (4).

Against this background, understanding and awareness of PRF among dental students have become increasingly important, as it equips future clinicians to effectively integrate regenerative therapies into periodontal practice. PRF, derived autologously from the patient's own blood, stands out due to its high biocompatibility, simplicity of preparation, and potent regenerative capacity (5). It functions as a biologically active scaffold that enhances angiogenesis, promotes tissue repair, and accelerates wound healing (5,6). The advent of newer PRF variants—L-PRF, A-PRF, i-PRF, and T-PRF—has further diversified its applications in complex periodontal and oral surgical procedures (5,7). Current literature highlights its wide-ranging utility in guided tissue regeneration, extraction socket management, sinus lift surgeries, and intrabony defect repair, primarily owing to its sustained release of essential growth factors that support both soft and hard tissue regeneration (6). The autologous nature of PRF minimizes the risk of immunogenic reactions and cross-contamination, making it a safe, cost-effective, and clinically dependable adjunct in periodontal therapy (6,8). Nevertheless, despite its established biological benefits, studies consistently reveal that many dental students possess limited understanding of PRF preparation protocols, indications, and differences among its variants, indicating a gap between theoretical awareness and practical application (9–11). The aim of the present study is to evaluate the knowledge, awareness, and perceptions of PRF and its recent advancements among dental students and practitioners.

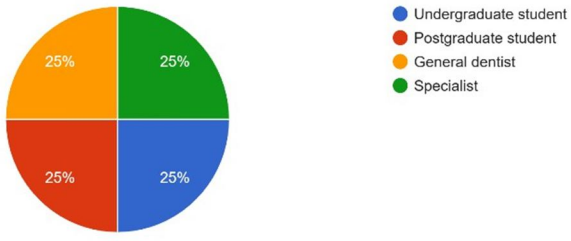
II. MATERIALS AND METHODS

This descriptive cross-sectional study was designed to assess the knowledge and awareness of Platelet-Rich Fibrin (PRF) and its newer trends in periodontics among dental students and practitioners (9–12). Conducted over a three-month period from August to October 2025, the research included phases of data collection, analysis, and report compilation (12). Ethical approval was secured from the Institutional Review Board prior to initiation, and the study was carried out under the guidance of the Department of Periodontics at a private dental college in Chennai (12). Data were obtained through a structured, pre-validated questionnaire aimed at evaluating participants' understanding of PRF and its advanced applications in periodontal therapy (9–11). A total of 100 respondents participated, completing a self-administered digital survey distributed via social media platforms (11). Demographic information was also collected, and the data were analyzed using Microsoft Excel to compute percentage distributions and organize the results for interpretation (12). Data obtained from Google Forms were exported to Excel for analysis (12). Descriptive statistics, including frequency and percentage, were calculated for all variables (12). Differences between groups were evaluated using the Chi-square test of independence, while Fisher's Exact Test was applied in cases where expected counts were low (13,14). The null hypothesis (H_0) posits that no association exists between the professional group and survey responses, whereas the alternative hypothesis (H_1) suggests that a significant association does exist (13). A p-value of less than 0.05 was deemed statistically significant (13). Additionally, a comprehensive (pooled) Chi-square test was conducted to assess overall differences in PRF awareness across the four groups (15,16).

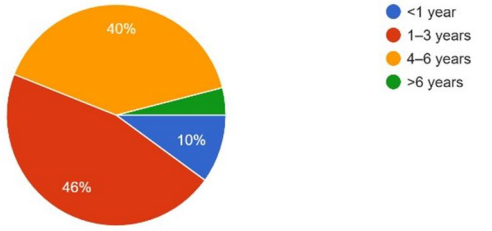
III. RESULTS

A total of 100 individuals participated in the survey, evenly divided among undergraduate students, postgraduate students, general dentists, and specialists, each constituting 25% of the sample (9,10,1112). The majority of respondents indicated having 1–3 years (46%) or 4–6 years (40%) of clinical experience, with a significant portion being associated with dental colleges (53%) (12). Notable differences were identified in the distribution of workplaces among the groups ($p = 0.003$), whereas clinical experience did not show significant variation ($p = 0.217$) (13). The knowledge-based items revealed mixed results: significant differences among groups were noted in recognizing the definition of PRF ($p = 0.039$), its generational classification ($p = 0.008$), the year it was introduced ($p = 0.020$), PRF derivatives ($p = 0.036$), features of L-PRF ($p = 0.026$), advantages of A-PRF ($p = 0.000009$), and benefits of i-PRF ($p = 0.0029$). Furthermore, technical knowledge exhibited significant differences regarding fibroblast scaffold type ($p = 0.027$), PRF tube requirements ($p = 0.018$), and the mechanisms underlying advanced PRF-mediated regeneration ($p = 0.000689$). Items evaluating clinical applications, fibrin density, duration of growth factor release, T-PRF material and biocompatibility, concepts of Bio-PRF, components of sticky bone, and future trends did not reveal significant differences ($p > 0.05$), suggesting a uniform level of awareness across the groups (6,7). Perceptions concerning obstacles to the adoption of newer PRF systems ($p = 0.000126$) and interest in training programs ($p = 0.0016$) varied significantly, with postgraduate students and specialists demonstrating greater engagement .A global Chi-square test aggregating all survey responses confirmed a highly significant correlation between professional status and overall response patterns ($\chi^2 = 718.18$; $p = 0.0000228$), indicating that the overall knowledge and awareness of PRF and its emerging trends differ markedly across various professional levels (15,16).

A. Professional Status

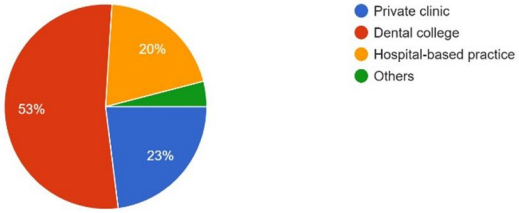


All groups (UG, PG, GP, Specialist) were equally represented at 25% each. **Clinical experience**



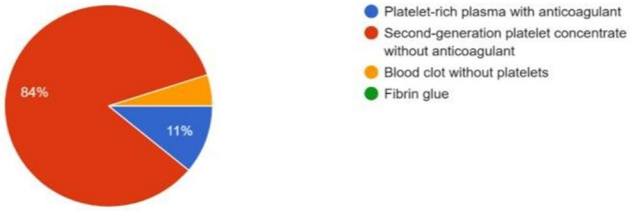
The majority of respondents (86%) reported having 1-6 years of clinical experience.

B. Type of Workplace



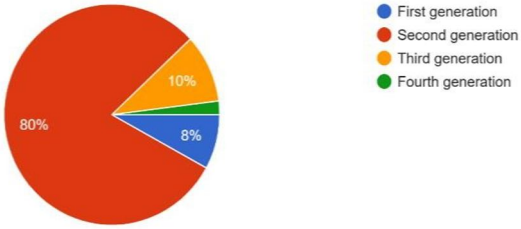
A majority of participants 53% work in a Dental College, followed by Private Clinic 23%.Workplace setting varied significantly among the professional groups, indicating that workplace type is strongly associated with the respondent's professional status.p = 0.003 (Significant)

C. PRF is best Described as



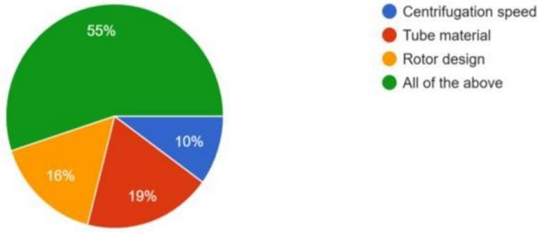
84% correctly identified PRF as a "Second-generation platelet concentrate without anticoagulant. Knowledge of the basic conceptual definition of PRF significantly differed across groups, with Specialists and PGs demonstrating higher conceptual understanding. p=0.039(Significant)

D. PRF Generation



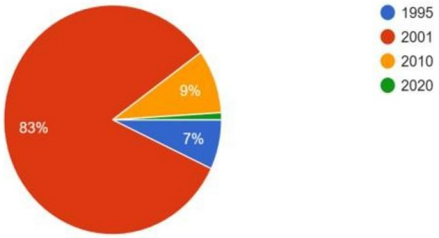
80% correctly classified PRF as belonging to the **"Second generation"** of platelet concentrates.Awareness of PRF generation classification significantly varied among the groups, confirming better conceptual knowledge among PGs and Specialists compared to UGs."p = 0.008"(Significant).

E. Growth factors release in PRF depends on



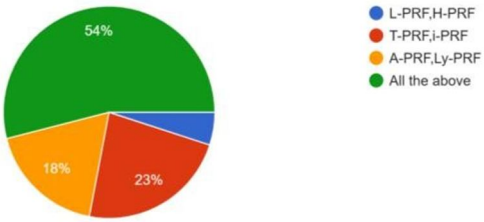
55% correctly selected "All of the above" indicating a comprehensive understanding of factors influencing release.The understanding of factors influencing PRF growth factor release was similar across all groups, showing no significant professional-level knowledge difference."p = 0.096" (Not Significant).

F. Choukroun introduced PRF in which year



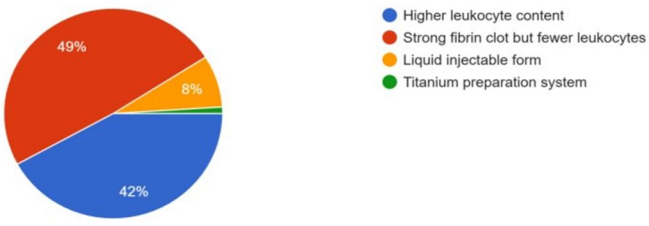
83% correctly answered **"2001"** as the year of PRF's introduction.Knowledge of the historical introduction of PRF significantly differed by professional status, with Specialists and PGs demonstrating greater historical awareness than other groups.p = 0.020"(Significant)

G. Second-generation PRF derivatives are



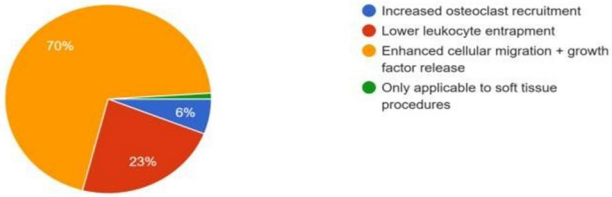
54% correctly identified **"All the above"** as derivatives.Awareness of the various PRF derivatives showed significant variation across groups, indicating uneven knowledge distribution about the product range.“p = 0.036” (Significant)

H. L-PRF is mainly characterized by



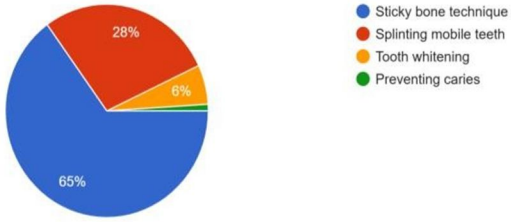
48% identified **"Strong fibrin clot but fewer leukocytes,"** though the actual correct answer is typically "Higher leukocyte content “.The understanding of L-PRF properties significantly differed, with PGs and Specialists showing higher (though not perfect) knowledge compared with UGs, highlighting a core concept gap.p = 0.026 (Significant)

I. A-PRF's advantage is



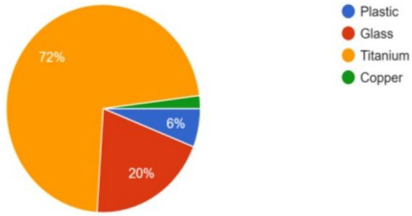
An overwhelming 81% correctly chose "Enhanced cellular migration + growth factor release.There was a highly significant difference in awareness of A-PRF advantages, demonstrating substantial variation in specialized knowledge, with Specialists showing the strongest awareness.p= 0.000009 (Highly Significant)

J. i-PRF is beneficial for



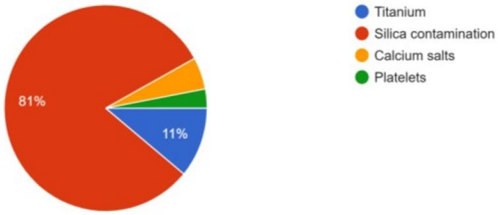
55%correctly identified its use for "Sticky bone technique," the most appropriate clinical application listed.“Knowledge regarding the clinical benefit of i-PRF significantly differed, indicating a clear advantage in clinical application awareness among Specialists and PGs. p = 0.0029” (Significant)

K. T-PRF uses which tube material?



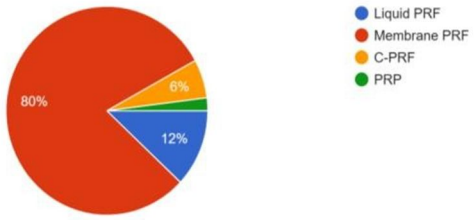
61% correctly identified "Titanium" as the primary tube material for T-PRF.Awareness of the tube material used in T-PRF did not significantly differ among groups, suggesting similar dissemination of this material science knowledge. p = 0.076 (Not Significant)

L. T-PRF improved biocompatibility due to absence of



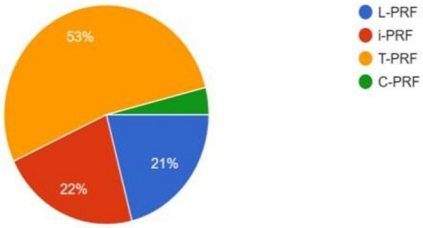
58% correctly attributed improved biocompatibility to the "absence of silica contamination. Understanding of the T-PRF's enhanced biocompatibility mechanism was comparable among all groups, showing no professional-level difference in knowledge. "p = 0.209 (Not Significant)

M. PRF type providing best scaffold for fibroblast migration



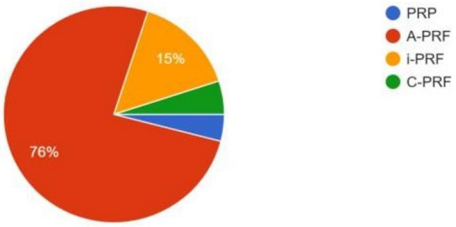
57% selected "Membrane PRF" as the type providing the best scaffold for fibroblast migration.Knowledge of scaffold-forming PRF types significantly differed across groups, indicating that awareness of regenerative properties is dependent on the professional level." p = 0.027" (Significant)

N. PRF type offering maximum fibrin density



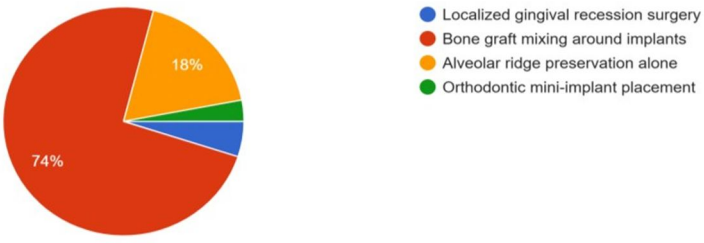
61% correctly identified **"T-PRF"** as the type offering maximum fibrin density.No **significant difference** was noted in recognizing which PRF type has the densest fibrin matrix, indicating uniform knowledge on this structural property." p = 0.064" (Not Significant)

Sustained Release of Growth factors for 28 days seen in



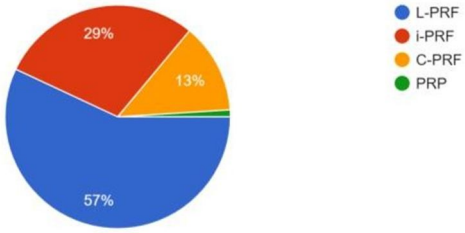
63% correctly chose **"A-PRF"** for its sustained growth factor release .The understanding of **growth factor release duration** across PRF types was similar across groups, showing a consistent level of awareness regarding kinetic properties. p = 0.117 (Not Significant) \

O. Suitable Clinical Indication for i-PRF



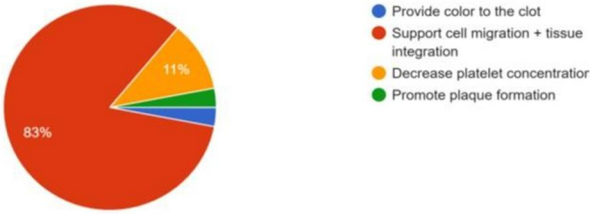
48% selected "Bone graft mixing around implants" as the most suitable clinical indication for i-PRF.The selection of ideal clinical indications for PRF did not differ significantly across groups, indicating a uniform, foundational awareness of applications. p = 0.465 (Not Significant)

P. PRF type most Effective as a Membrane



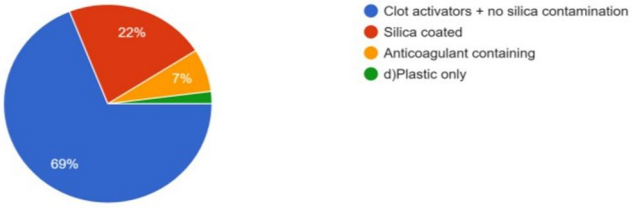
62% selected "L-PRF" as the most effective PRF membrane type.Knowledge regarding the most effective PRF membrane was comparable across the professional groups, showing no significant variation in practical knowledge. p = 0.123(Not Significant)

Q. Fibrin architecture in PRF mainly serves to



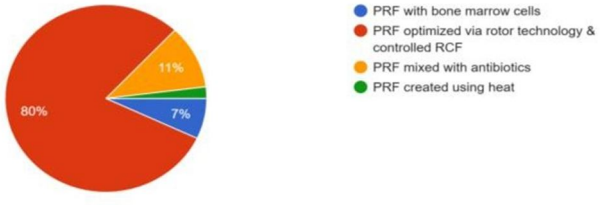
66% correctly chose "Support cell migration + tissue integration" as the main function of the fibrin architecture.The understanding of fibrin architecture's core biological role was consistent across groups, with no significant professional-level difference observed. p = 0.369(Not Significant)

R. PRF tubes should ideally be



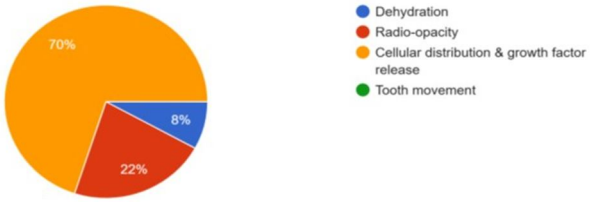
66% correctly identified the ideal tube as one with "Clot activators + no silica contamination.Knowledge regarding the correct type of tubes used for PRF preparation significantly differed, demonstrating a group-wise variation in technical preparation awareness . p= 0.018 (Significant)

S. Bio-PRF refers to



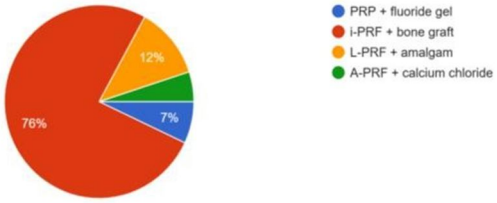
55% identified Bio-PRF as "PRF optimized via rotor technology & controlled RCF." Awareness of Bio-PRF terminology and concept were not significantly different among the groups, suggesting similar exposure to this specific product nomenclature. p = 0.202 (Not Significant)

T. Advanced PRF Improves Regenerative Healing by Enhancing



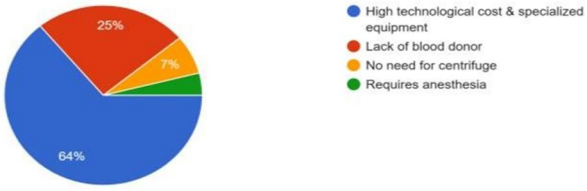
75% correctly linked Advanced PRF to "Cellular distribution & growth factor release There was a highly significant difference in understanding how advanced PRF enhances regeneration, suggesting clearly superior knowledge among Specialists and Pgs.
p = 0.000689 (Highly Significant)

U. Sticky bone is a combination of



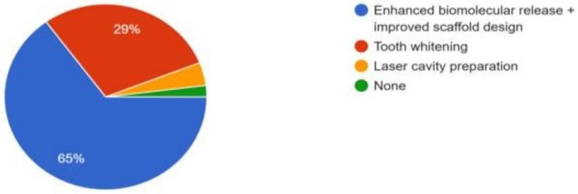
67% correctly identified the combination as **"i-PRF + bone graft.**Knowledge **of sticky bone components** did not significantly differ across groups, indicating similar foundational awareness of this common clinical application. p = 0.071 (Not Significant)

V. Major barrier in newer PRF systems



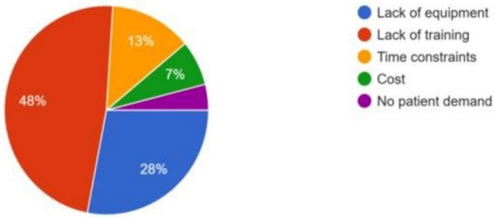
66% identified the major barrier as "High technological cost & specialized equipment." Perceived barriers to using newer PRF systems differed highly significantly among the groups, reflecting different clinical exposures and practical challenges associated with professional level. p = 0.000126 (Highly Significant)

W. Future PRF trends in periodontics focus on



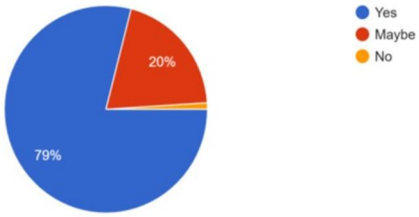
68% believe future trends focus on "Enhanced biomolecular release + improved scaffold design. Awareness of future directions in PRF research and applications did not vary significantly, suggesting similar exposure to review literature or future-focused content. "p = 0.174 (Not Significant)

X. What prevents frequent use of PRF in practice?



The most cited preventative factor 51% was "No patient demand." Perceived limitations to PRF usage (e.g., patient demand, equipment, cost) significantly differed, reflecting the unique practice realities of the different professional levels.p = 0.004 (Significant)

Y. Interest in Attending Training/workshops on advanced PRF techniques



79% expressed a clear "Yes" interest in attending advanced PRF training.Interest in learning advanced PRF methods significantly varied, with Specialists and PGs showing the strongest interest, highlighting a group-dependent demand for specialized education.
p = 0.0016 (Significant)

IV. DISCUSSION

The current research assessed the understanding and awareness of Platelet-Rich Fibrin (PRF) and its newer derivatives among various categories of dental professionals (9,10,11,12). Overall, the results revealed considerable variability in PRF-related knowledge across the four groups, with postgraduate students and specialists consistently demonstrating a higher level of awareness regarding advanced concepts such as PRF generation, characteristics of derivatives (L-PRF, A-PRF, i-PRF), scaffold properties, and regenerative mechanisms (3–7,9–11). These findings are consistent with prior literature indicating that increased clinical exposure, postgraduate education, and familiarity with regenerative procedures enhance the understanding of biomaterials utilized in periodontics (8–11). In contrast, undergraduate students and general dentists exhibited a relatively limited comprehension of intricate aspects such as fibrin architecture, determinants of biocompatibility, and distinctions among emerging PRF systems, highlighting a deficiency in both foundational and applied training in regenerative dentistry (9,10,11). Several items did not show significant differences across groups, particularly those pertaining to clinical indications, fibrin density, and basic procedural considerations, indicating that general awareness of PRF's routine applications is fairly uniform among clinicians (6,7). Notably, significant differences were observed among groups regarding major barriers to the adoption of newer PRF systems—such as equipment costs and lack of training—with specialists reporting fewer challenges (12,13,14). A strong interest in additional training across all groups underscores the necessity for structured educational programs and hands-on workshops aimed at improving competence in advanced PRF protocols. The global Chi-square test confirmed that overall response patterns varied significantly by professional level, highlighting the need for curriculum enhancement at the undergraduate level and ongoing professional development for practicing dentists(15,16). Collectively, these findings emphasize the importance of targeted education in closing the knowledge gap and promoting effective use of PRF in clinical practice periodontal regeneration (16).

V. CONCLUSION

The current survey reveals significant differences in the knowledge and awareness of PRF and its emerging trends among dental professionals. Postgraduate students and specialists exhibited a notably greater comprehension of advanced PRF concepts when compared to undergraduate students and general dentists, which reflects variations in their training exposure and clinical experience (9–12). While the basic understanding of routine PRF applications was relatively uniform across the groups, awareness of specific derivative characteristics, regenerative mechanisms, and recent developments displayed distinct disparities. A strong interest in additional training highlights the necessity to enhance academic curricula and provide organized continuing education programs (12,13,14).

In summary, the results underscore the critical need to improve PRF-related education and clinical training to ensure consistent competency in regenerative periodontal practice (15,16).

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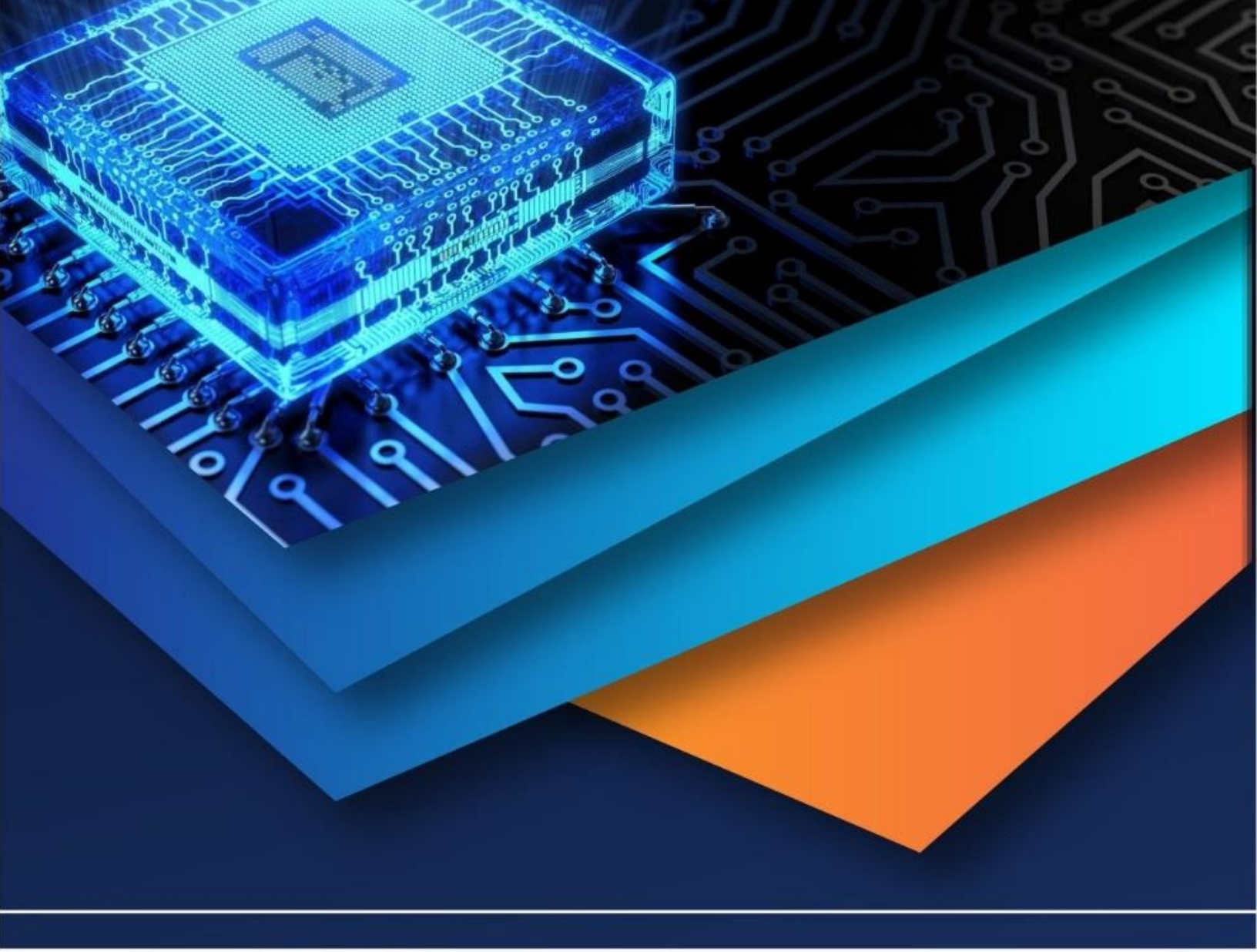

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