

## INTRODUCTION

In restorative dentistry, adhesion is a fundamental step for the success of current treatments. Adhesion to enamel is stable and predictable, on the other hand, adhesion to dentin is still not effective and presents many failures in the adhesive interface due to the complexity of the substrate, such as: collagen fibrils, peri and intratubular demineralization and humidity<sup>1</sup>. The technique is still sensitive to operator skill, material used and number of clinical steps, which results in a higher failure rate.

There is no perfect adhesive system or one that fits all clinical situations, the ideal adhesive would be one that when applied to the dentin is very hydrophilic in order to properly wet it and once polymerized, it becomes a highly hydrophobic element, in order to repel water, prevent its absorption and resist hydrolysis for a longer period of time<sup>2,3</sup>.

## OBJECTIVES

### GENERAL

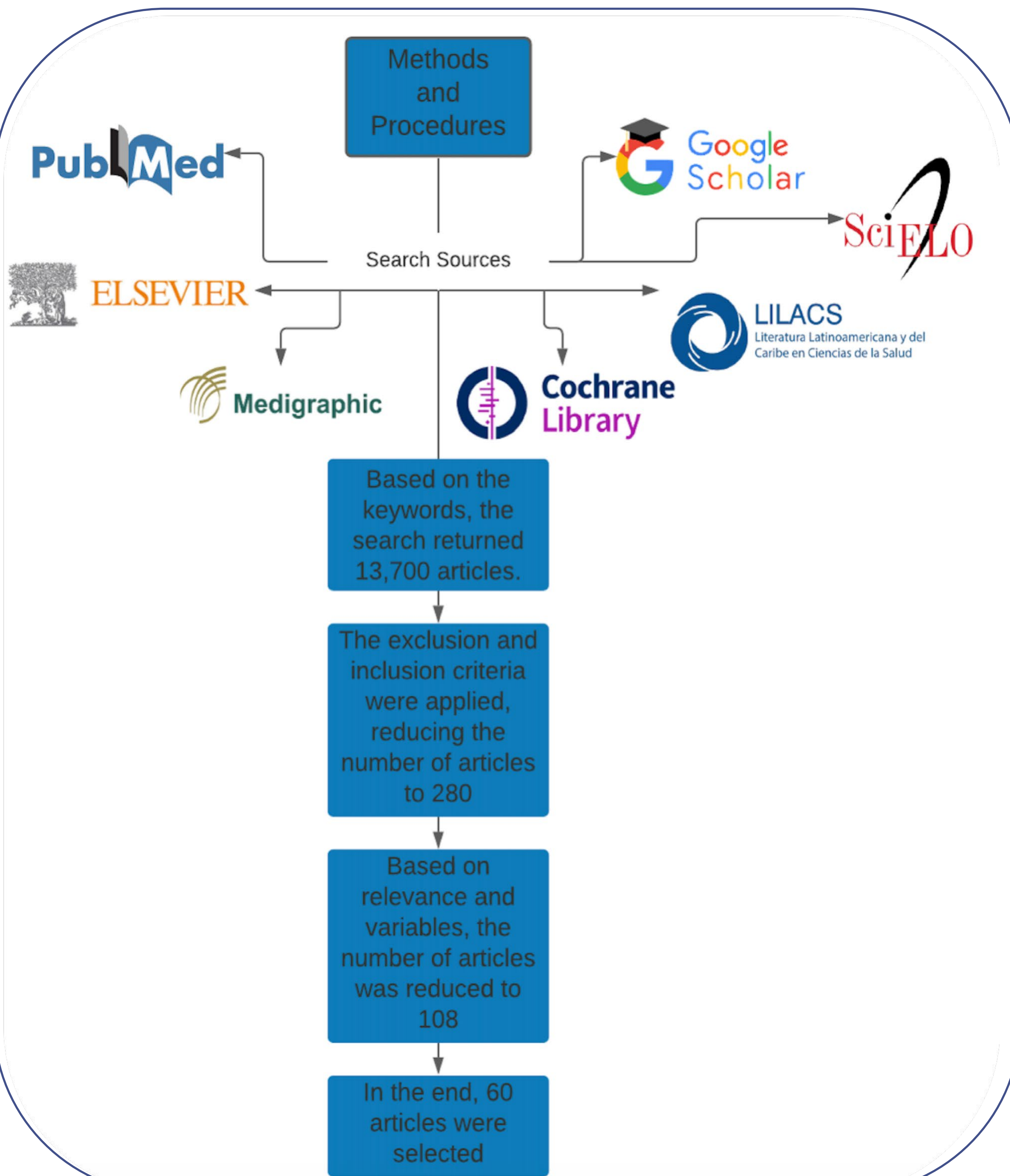
-Compare the adhesion levels between etch-and-rinse and self-etching adhesive systems on dentin.

### SPECIFIC

-Describe the composition of the different adhesive systems.

-Analyze the failures that can occur in dentin adhesive protocols. -Identify the factors that make dentin a difficult substrate to bond. -Demonstrate the clinical situations in which each adhesive system should be used.

## MATERIALS & METHODS

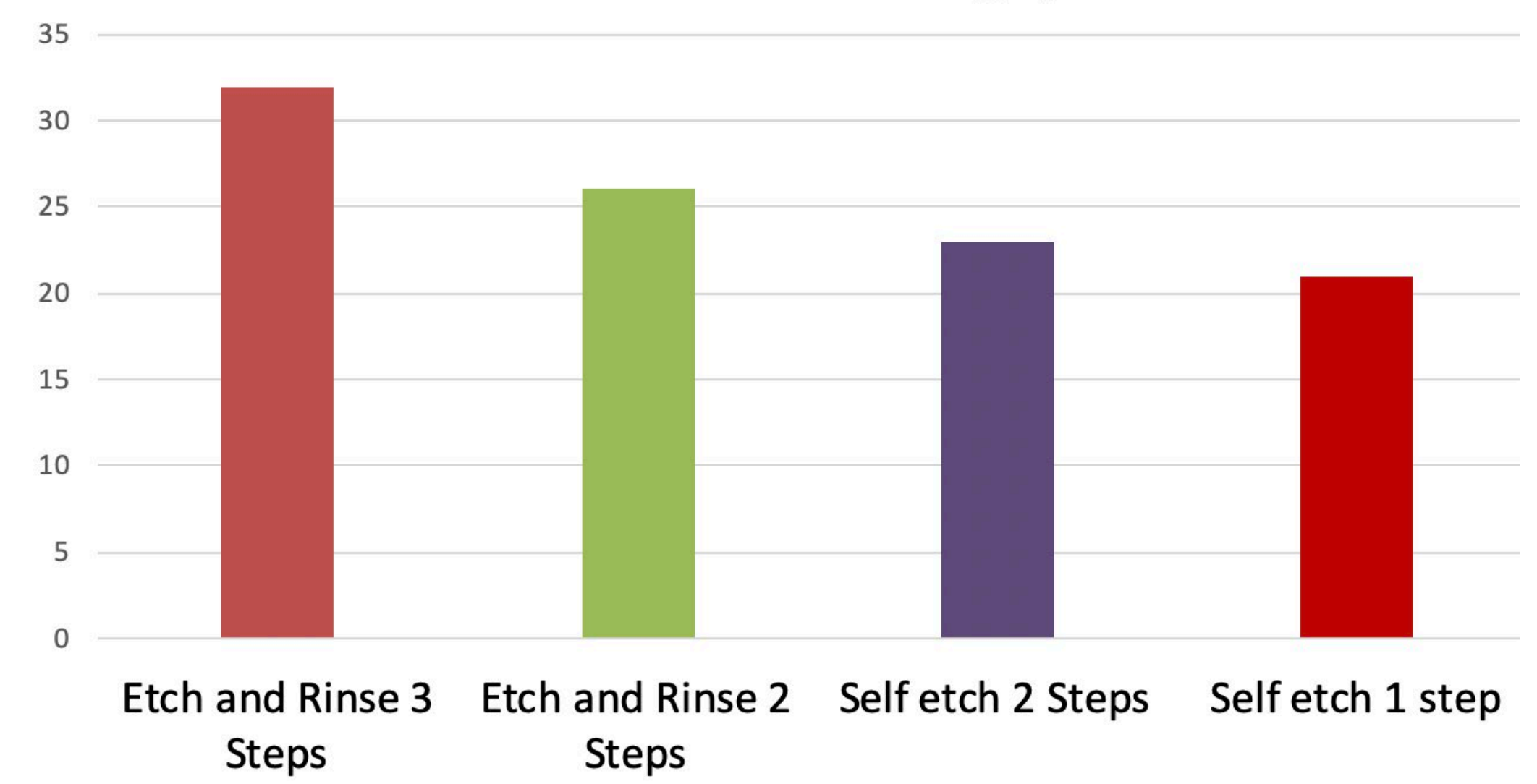


## REFERENCES

- 1- Flury S. Principios de la adhesión y de la técnica adhesiva. Quintessence. 2012 1;25(10):604-9.
- 2- ian F, Zhou L, Zhang Z, Niu L, Zhang L, Chen C, et al. Paucity of nanolayering in resin-dentin interfaces of MDP-based adhesives. J Dent Res 2016;95(4):380-7.
- 3- Perdigão J, Ceballos L, Giráldez I, Baracco B, Fuentes MV. Effect of a hydrophobic bonding resin on the 36-month performance of a universal adhesive-a randomized clinical trial. Clin Oral Investig 2020;24(2):765-76.
- 4- Aldaz Paltan CJ. *Protocolos de adhesión aplicados por los estudiantes del 8vo semestre de la Facultad Piloto de Odontología (eficiencia y eficacia de los adhesivos usados en odontología restauradora)* (Bachelor's thesis, Universidad de Guayaquil. Facultad Piloto de Odontología).
- 5- Perdigão J. Current perspectives on dental adhesion:(1) Dentin adhesion-not there yet. Japanese Dental Science Review. 2020.
- 6- Garcilazo-Gómez A, Miguelena-Muro KE, Guerrero-Ibarra J, Rios-Szalay E, Bonilla-Haro R. Factores que afectan y mejoran la adhesión en dentina, una puesta al día. Una revisión de la literatura. Revista ADM. 2019 ;76(3):162-8.

## RESULTS AND DISCUSSION

### Adhesive Values in Megapascals



- Aldaz<sup>4</sup> reports that etch and rinse adhesives, despite their high level of adhesion, tend to cause postoperative sensitivity in patients when the technique is not correctly applied.
- Perdigao<sup>5</sup> shows promising results for the use of self-etching systems in enamel bonding tests and not so good results for dentin.
- Garcilazo-Gomez et al<sup>6</sup> highlights that self-etching adhesive systems can cause excessive dentin demineralization, which can increase the thickness of the hybrid layer with a subsequent lack of complete penetration of the adhesive resin into the tubules, resulting in low adhesion values.

## CONCLUSIONS

- I. Dentin is an unpredictable substrate and can generate failures at the dentin/restorative material interface. The failures are very variable and range from not using absolute isolation, not knowing the adhesive protocol recommended by the manufacturer, drying the dentin, inefficient scrubbing, non-volatilization of solvents and poor polymerization.
- II. Dentin is a variable substrate with moisture and a lattice of tubules that must be demineralized for subsequent priming and bonding. This substrate is unpredictable and protocols are still evolving.
- III. Three step etch and rinse systems are sensitive to the technique applied by the operator but are recommended to make dentin bonding more predictable.
- IV. Based on the results, it is affirmed that there is a statistically significant difference between the adhesion levels of etch and rinse systems and self-etch systems. Better results of adhesion to dentin can be noted with the three step etch and rinse, observing an average adhesion higher than 30 Mpa.

## RECOMENDATIONS

- Read the manufacturer's instructions before using any adhesive system.
- The use of absolute isolation is far superior to relative isolation during the application of adhesive systems.
- Use phosphoric acid with high thixotropy.
- Employ antiseptic solutions such as 2% chlorhexidine to inhibit metalloproteinases.
- Do not use triple syringe to dry dentin. Use absorbent paper.
- Apply etch and rinse adhesive systems on dentin. Be sure to rub well for 15-30 seconds.
- Volatilize for 15-30 seconds to evaporate solvents. Care should be taken the air must be free of water and/or oil.
- Use a light curing lamp that exceeds 1200 mw/cm<sup>2</sup>.

## ADDITIONAL INFORMATION

