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## Predictive factors on the efficacy and risk/intensity of tooth sensitivity of dental bleaching: A multi regression and logistic analysis



#### Márcia Rezende, Alessandro D. Loguercio, Stella Kossatz, Alessandra Reis\*

School of Dentistry, State University of Ponta Grossa, Ponta Grossa, Paraná, Brazil

#### ARTICLE INFO

#### ABSTRACT

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Keywords: Dental bleaching Predictive factors Dentin sensitivity Color change Hydrogen peroxide *Objectives*: The aim of this study was to identify predictor factors associated with the whitening outcome and risk and intensity of bleaching-induced tooth sensitivity from pooled data of 11 clinical trials of dental bleaching performed by the same research group.

*Methods:* The individual patient data of several published and ongoing studies about dental bleaching was collected and retrospectively analyzed. At the patient-level, independent variables (bleaching techniques [at-home and in-office protocols], sex, age and baseline tooth color in shade guide unit [SGU]) as well as dependent variables (color change in shade guide units ( $\Delta$ SGU), color change in the CIEL\**a*\**b*\* system ( $\Delta$ *E*), risk and intensity of TS in a visual analog scale) were collected. Multivariable linear regression and multivariable logistic regression models were carried out using backward elimination whenever the *p*-values were higher than 0.05.

*Results*: A significant relationship between baseline color and age on color change estimates was detected (p < 0.001). Every increase of one SGU in the baseline color resulted in an increase of approximate 0.66 in the final  $\Delta$ SGU and 2.48 for the  $\Delta E$ . For every increase of one year in the participant's age we observed a decrease of the whitening degree of 0.07 for the final  $\Delta$ SGU and 0.69 for the  $\Delta E$ . The bleaching technique was shown to be a significant predictor of  $\Delta$ SGU (p < 0.001) but not of  $\Delta E$ . In regard to TS, baseline color and bleaching technique are significant predictors (p < 0.001). The risk of TS for at-home bleaching was 51% (95% CI 41.4–60.6) and for the in-office 62.9% (95% CI 56.9–67.3).

*Conclusions:* Younger patients with darker teeth reach a higher degree of whitening. Patient with darker teeth and submitted to at-home bleaching presents lower risk and intensity of TS.

*Clinical significance:* The baseline color of the teeth and the patient's age is directly related to the effectiveness of dental bleaching and TS.

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#### 1. Introduction

The increase in patient awareness of the ability to improve their smiles has been responsible for the boom in esthetic dentistry in recent years. Among all therapies for improving the patient's smile, dental bleaching has been widely employed by dental practitioners, as it is a very conservative, simple, low-cost and safe procedure. A survey conducted in the United Kingdom and published in 2008 revealed that more than 80% of general dental practitioners perform dental bleaching in their offices [1].

E-mail addresses: mfssiqueira@uol.com.br (M. Rezende),

Several studies have already reported the effectiveness of athome and in-office dental bleaching [2–7]. This means that all patients may have their teeth whitened to some degree, although the individual whitening response is affected by multiple factors [8], including those associated with product formulation and usage. The higher the peroxide concentration and the longer the contact time, the faster the whitening [9–11].

Although this explains the differences observed between patients when subjected to different bleaching therapies, it does not justify the individual variations observed after the application of the same bleaching protocol. For instance, most clinical trials [12–15] report a mean change of 3 shade guide units after one inoffice bleaching session of 45 min with 35% hydrogen peroxide; however, this protocol may not produce any noticeable color change in some patients, which may impact patients' and professionals' expectations and influence patients' confidence in professionals.

<sup>\*</sup> Corresponding author at: Universidade Estadual de Ponta Grossa, Departamento de Odontologia, Rua Carlos Cavalcanti, 4748, Bloco M, Sala 64, Uvaranas, Ponta Grossa, Paraná 84030-900, Brazil.

aloguercio@hotmail.com (A.D. Loguercio), stellakp@hotmail.com (S. Kossatz), reis\_ale@hotmail.com (A. Reis).

#### Table 1

Characteristics of the studies from each raw data were collected (n = 426 patients).

	Study	Groups	Study	Material	Bleaching	Study sample	Participant's age	Baseline	Method	Method of
Rezende et al. [28] [29] [20] [21	-	*	design	(brand)	protocol	[sample	- mean $\pm$ SD	Color	of	tooth sensitivity
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Rezende et al.     G1: At-home without     Parallel     168 (5)     3 h/daily for 3 weeks     40 [40]     23.1 ± 5.3 [18-40]     2 or (18-40]     SCU Vita weeks     NRS 0-4       Rzzende et al.     G1: At-home with G2: At-home with Office     Parallel     35% HP <sup>2</sup> zessions, 45 min     63 [60]*     22.7 ± 4.1     A1 or     SCU Vita Spectrophotomer <sup>4</sup> NRS 0-4       [17]     Dexamethasone +in- Office     Office (5)     2.7 ± 4.1     A1 or     SCU Vita Spectrophotomer <sup>4</sup> NRS 0-4       [20]     G2: In-Office (5): In-Office     Parallel     G1: 25%     2 sessions, G2: SM HP     30 [14]*     [18-32]     61 ± 8.6     A2 or     SCU Vita Spectrophotomer <sup>4</sup> NRS 0-4       [30]     G2: In-Office     Parallel     G1: 25% HP     1 week-interval (3 × 15 min) each     [18-42]     darker     Classical <sup>16</sup> NRS 0-4       [23]     Simoker (1): At-home in non- smokers     Parallel     10% CP <sup>10</sup> 3 h/daily for 3 weeks     20 [16]*     27 ± 8.4     A2 or     SCU Vita (18-46]     NRS 0-4       [24]     G2: At-home in non- smokers     Sim HP <sup>10</sup> 1 week-interval (3 × 15 min) each     30 [30] <td< th=""><th></th><th></th><th>_</th><th></th><th>_</th><th>this study]</th><th></th><th></th><th>assessment</th><th></th></td<>			_		_	this study]			assessment	
$ \begin{bmatrix} 28 \\ Giff e e xposure in confec exposure in co$	Rezende et al.	G1: At-home without	Parallel	16% CP <sup>d</sup>	3 h/daily for 3	40 [40]	23.1 ± 5.3	A2 or	SGU Vita	NRS 0-4
Rezende et al. C1: Ar-10mic Will coeffice approximate and the formation of the approximate approximat	[28]	coffee exposure			weeks		[18-40]	darker	Classical <sup>e</sup>	VAS 0-10
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$ \begin{bmatrix} 17 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0$	Rezende et al.	G1:	Parallel	35% HP <sup>g</sup>	2 sessions.	63 [60] <sup>a</sup>	$22.7 \pm 4.1$	A1 or	SGU Vita	NRS 0-4
office   55 min   Scu Vira   Spectrophotomer     G2: Pacebo in- Office   (3 × 15 min) each   26.1 ± 8.6   A2 or   SGU Vira   NRS 0-4     [30]   home*   Paralle   G1: 55 W   1 veckinterval   (18-42)   (18-42)   Cassical*   SGU Vira   NRS 0-4     [30]   home*   G2: In-Office   Paralle   G1: 55 W   2 sessions,   60 [45]*   218-43   C2 or   C3 UVira   NRS 0-4     [31]   G2: In-Office   Paralle   NC   3 veckinterval   60 [45]*   218-43   Ca or   Cassical*   Paralle   NRS 0-4     [23]   smokers   Saving 40-4   inveckinterval   Naing 40-4   inveckinterval   Cassical*   Paralle   NRS 0-4     [23]   smokers   Saving 40-4   inveckinterval   Saving 40-4   inveckinterval   Cassical*   Paralle   NRS 0-4     [24]   smokers   Saving 40-4   inveckinterval   inveckinterval   Saving 40-4   inveckinterval   <	[17]	Dexamethasone + in-			1 week-interval		[18-33]	darker	Classical <sup>e</sup>	VAS 0-10
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		G2: Placebo + in-			$(3 \times 15 \text{ min})$ each				SGU Vita	
Register et al. [27] [30] home" [31] $[30]$ home" [32] home" [32] $[31]$ home" [32] $[32]$ home" [32] home" [32] $[32]$ home" [32] $[32]$ home" [32] home" [33] home" [33] home" [34] home" [35] ho	Rezende et al	Office + at-	Darallal	C1.35%	2 sessions	30 [14] <sup>b</sup>	$261 \pm 8.6$	A2 or	SCIL Vita	NRS 0-4
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de Geus et al. [23]   G1: At-home in smokers   Parallel   10% CP <sup>m</sup> 3 h/daily for 3 weeks   120 [60] <sup>c</sup> 25.2 ± 6.6 [18-46]   A2 or darker   SGU Vita Classical <sup>e</sup> Spectrophotomer   NRS 0-4 VAS 0-10     Bonafé et al. [15]   G1: In-office in sound 22: In-office in restored teeth G2: lacebot in-office   Parallel   G1 and G2: 55% HP <sup>g</sup> 2 essions, 1 week-interval 45 min (3 × 15 min) each   30 [30]   24.8 ± 4.5 [18-35]   A2 or darker   SGU Vita Classical <sup>e</sup> Spectrophotomer   NRS 0-4     [29]   G2: desensitizing + in- office   Parallel   G1 and G2: S5% HP <sup>g</sup> 2 essions, 1 week-interval 45 min (3 × 15 min) each   30 [30]   24.8 ± 4.2 [18-35]   A2 or darker   SGU Vita Classical <sup>e</sup> Spectrophotomer   NRS 0-4     Mena-Serrano et al. [31]   G1: In-office 20% HP (G2: In-office 35% HP <sup>g</sup> )   G1 and G2: 2 sessions, 35% HP <sup>g</sup> 2 sessions, 1 week-interval 45 min   78 [78]   22.5 ± 3.8 [18-33]   A3 or darker   SGU Vita Classical <sup>e</sup> Spectrophotomer   NRS 0-4     Mena-Serrano et al. [31]   G1: ho-office 20% HP (G4: In-office 35% HP (G4: In-office 35% HP <sup>g</sup> )   G1 and G2: 35% HP <sup>g</sup> 2 sessions, 35% HP <sup>g</sup> 78 [78]   22.5 ± 3.8 (18-33]   A3 or darker   SGU Vita Classical <sup>g</sup> NRS 0-4     de Paula et al. [24]   G1: ho-office 35% HP <sup>g</sup> S3 MP <sup>g</sup> 1 week-interval (				Dide	application					
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And Participation45 min (3 × 15 min) each24.8 ± 4.2 (1 × 15 min) eachA2 or (1 × 15 min) eachSpectrophotomer <sup>f</sup> NRS 0-4Bonafé et al.G1: placebo+in-office (2 desensitizing+in- officeParalleG1 and G2: (3 × 15 min) each2 sessions, (3 × 15 min) each30 [30]24.8 ± 4.2 (1 × 05]A2 or (arkerSGU Vita (Lassical <sup>e</sup> ) (Spectrophotomer <sup>f</sup> NRS 0-4Mena-Serran et al. [31]G1: In-office 20% HP (2 Lin-office 20%ParalleG1 and G2: (3 × 15 min) each2 sessions, (3 × 15 min) each78 [78] (3 × 15 min) each22.5 ± 3.8 (18-33]A3 or (ArkerSGU Vita (Lassical <sup>e</sup> )NRS 0-4Mena-Serran et al. [31]G1: In-office 20% (12 Lin-office 35% HP (3 × 15 min) each35% HP <sup>g</sup> 1 week-interval (3 × 15 min) each[18-33]A3 or (ArkerSGU Vita (Lassical <sup>e</sup> )NRS 0-4Mena-Serran et al. [31]G1: Ascorbic acid+in- (3 × 15 min) each35% HP <sup>g</sup> 35% HP <sup>g</sup> 35% HP <sup>g</sup> 1 week-interval (3 × 15 min) each[18-33]A3 or (ArkerSGU Vita (Lassical <sup>e</sup> )NRS 0-4Mena-Serran et al. [31]G1: Ascorbic acid+in- (3 × 15 min) each35% HP <sup>g</sup> 35% HP <sup>g</sup> 39 [15] <sup>a</sup> 26.8 ± 8.2 (18-45]C2 or (Ca or (Ca or (Ca cre (Cassical <sup>e</sup> ))NRS 0-4Mena-Serran et al. [24]G1: Ascorbic acid+in- (GficeParallelG1 and G2: (3 × 15 min) each30 [30]25.5 ± 6.4C2 or (Ca or (	[15]	teeth		35% HP <sup>g</sup>	1 week-interval	[]	[18-35]	darker	Classical <sup>e</sup>	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		G2: In-office in			45 min				Spectrophotomer <sup>f</sup>	
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[25]   62. desensitizing fine   55% fire   1 vector interval   [16-35]   darker   Classical     office   45 min   (3 × 15 min) each   Spectrophotomer <sup>f</sup> Spectrophotomer <sup>f</sup> Mena-Serrano   G1: In-office 20% HP   Parallel   G1 and G2:   2 sessions,   78 [78]   22.5 ± 3.8   A3 or   SGU Vita   NRS 0-4     et al. [31]   G2: In-office 20%   20% HP°   1 week-interval   [18–33]   darker   Classical*   VAS 0-10     mena-Serrano   G1: In-office 35% HP   G3 and G4:   45 min   Spectrophotomer   Spectrophotomer     G4: In-office 35%   FMP+LED/Laser <sup>n</sup> G3 and G2:   2 sessions,   39 [15] <sup>a</sup> 26.8 ± 8.2   C2 or   SGU Vita   NRS 0-4     [24]   Office   35% HP <sup>g</sup> 1 week-interval   [18-45]   darker   Classical*   VAS 0-10     G2: Placebo + in-   45 min   Sist Simin) each   Spectrophotomer   Spectrophotomer   Spectrophotomer   VAS 0-10     G2: Placebo + in-   G1 and G2:   2 sessions,   30 [30]   25.5 ± 6.4   C2 or   SGU Vita   NRS 0-4     [25]   Office	Bonafe et al.	G1: placebo + in-office	Parallel	GI and G2:	2 sessions,	30 [30]	$24.8 \pm 4.2$	A2 OF darkor	SGU Vita	NRS 0-4
Mena-Serrano et al. [31]G1: In-office 20% HP (2: In-office 20% HP+LED/Laser <sup>n</sup> Parallel 	[29]	office		55% HF*	45 min		[10-33]	udikei	Spectrophotomer <sup>f</sup>	
Mena-SerranoG1: In-office 20% HP G2: In-office 20% HP+LED/Laser <sup>n</sup> ParallelG1 and G2: 20% HP°2 sessions, 1 week-interval 45 min G3: 15 min) each78 [78] (1 week-interval (18–33]A3 or darkerSGU Vita Classical* VAS 0–10 SpectrophotomerNRS 0–4 VAS 0–10 Spectrophotomerde Paula et al.G1: Ascorbic acid+in- (G2: Placebo+in- (G5)ParallelG1 and G2: (S5% HP* (S5% HP*2 sessions, (S5% HP*39 [15]* (S3 × 15 min) each26.8 ± 8.2 (S6.8 ± 8.2)C2 or (C2 or (C2 or (C2 or (C1 conto) conto) conto) conto) conto (C1 conto) conto) contoNRS 0–4 (NRS 0–4de Paula et al.G1: Ascorbic acid+in- (G2: Placebo+in- (G1ceParallelG1 and G2: (S5% HP*2 sessions, (S5% HP*39 [15]* (S3 × 15 min) each26.8 ± 8.2 (S6.8 ± 8.2)C2 or (C2 or (SGU Vita)SGU Vita (NRS 0–4de Paula et al.G1: Etoricoxib+in- (GficeParallelS5% HP* (S5% HP*2 sessions, (S3 × 15 min) each30 [30] (S3 × 15 min) each25.5 ± 6.4 (C2 or (C2 or (C2 or (C2 or (C3 scicl*))SGU Vita (NRS 0–4NRS 0–4 (Cassical*)de Paula et al.G1: Etoricoxib+in- (GficeParallel35% HP*2 sessions, (S5% HP*30 [30] (S3 × 15 min) each25.5 ± 6.4 (C2 or (C2 or (C2 or (C2 or (C1 scicl*))SGU Vita (C1 scicl*)NRS 0–4 (C1 scicl*)de Paula et al.G1: Etoricoxib+in- (GficeParallel35% HP*2 sessions, (S6 × 15 × 16 × 16 × 16 × 16 × 16 × 16 × 1		onnee			$(3 \times 15 \text{ min})$ each				opeenophotomer	
et al. [31] G2: In-office 20% $20\%$ HP <sup>o</sup> 1 week-interval [18–33] darker Classical <sup>e</sup> VAS 0–10 HP + LED/Laser <sup>n</sup> G3 and G4: 45 min G3: In-office 35% HP 35% HP <sup>g</sup> (3 × 15 min) each G4: In-office 35% HP + LED/Laser <sup>n</sup> de Paula et al. G1: Ascorbic acid + in - Parallel G1 and G2: 2 sessions, 39 [15] <sup>a</sup> 26.8 ± 8.2 C2 or SGU Vita NRS 0–4 [24] Office 35% HP <sup>g</sup> 1 week-interval [18–45] darker Classical <sup>e</sup> VAS 0–10 G2: Placebo + in Office 35% HP <sup>g</sup> 2 sessions, 30 [30] 25.5 ± 6.4 C2 or SGU Vita NRS 0–4 (25] Office 1 week-interval [18–42] darker Classical <sup>e</sup> NRS 0–4 (25] Office 1 week-interval [18–42] darker Classical <sup>e</sup> NRS 0–4 (25] Office 1 week-interval [18–42] darker Classical <sup>e</sup> NRS 0–4	Mena-Serrano	G1: In-office 20% HP	Parallel	G1 and G2:	2 sessions,	78 [78]	$\textbf{22.5}\pm\textbf{3.8}$	A3 or	SGU Vita	NRS 0-4
HP+LED/Laser <sup>in</sup> G3 and G4:   45 min   Spectrophotomer     G3: In-office 35% HP   35% HP <sup>g</sup> (3 × 15 min) each   Spectrophotomer     G4: In-office 35%   HP+LED/Laser <sup>in</sup> 35% HP <sup>g</sup> (3 × 15 min) each   Spectrophotomer     de Paula et al.   G1: Ascorbic acid+in-   Parallel   G1 and G2:   2 sessions,   39 [15] <sup>a</sup> 26.8 ± 8.2   C2 or   SGU Vita   NRS 0-4     [24]   Office   35% HP <sup>g</sup> 1 week-interval   [18–45]   darker   Classical <sup>e</sup> VAS 0-10     G2: Placebo + in-   Office   3 × 15 min) each   Stabular   Spectrophotomer <sup>f</sup> VAS 0-10     [25]   Office   1 week-interval   [18–42]   darker   Classical <sup>e</sup> NRS 0-4     [25]   Office   1 week-interval   [18–42]   darker   Classical <sup>e</sup> NRS 0-100     [25]   Office   1 week-interval   [18–42]   darker   Classical <sup>e</sup> NRS 0-100     [25]   Office   1 week-interval   [18–42]   darker   Classical <sup>e</sup> NRS 0-100     [25]   Office   1 week-interval   I week-interval   Spectrophotomer <sup>f</sup> <	et al. [31]	G2: In-office 20%		20% HP <sup>o</sup>	1 week-interval		[18-33]	darker	Classical <sup>e</sup>	VAS 0-10
G3: In-office 35%   G4: In-office 35%     HP + LED/Laser <sup>n</sup> de Paula et al.   G1: Ascorbic acid + in-   Parallel   G1 and G2:   2 sessions,   39 [15] <sup>a</sup> 26.8 ± 8.2   C2 or   SGU Vita   NRS 0-4     [24]   Office   35% HP <sup>g</sup> 1 week-interval   [18-45]   darker   Classical <sup>e</sup> VAS 0-10     G2: Placebo + in-   0ffice   (3 × 15 min) each   55% HP <sup>g</sup> 2 sessions,   30 [30]   25.5 ± 6.4   C2 or   SGU Vita   NRS 0-4     [25]   Office   1 week-interval   [18-42]   darker   Classical <sup>e</sup> NRS 0-100     [25]   Office   1 week-interval   [18-42]   darker   Classical <sup>e</sup> NRS 0-100     G2: Placebo + in-   45 min   45 min   59 min   59 min   59 min   59 min     G2: Placebo + in-   45 min   1 week-interval   [18-42]   darker   Classical <sup>e</sup> NRS 0-100     G2: Placebo + in-   45 min   1 week interval   59 min   59 min   59 min   59 min		HP+LED/Laser"		G3  and  G4:	45  min (2 × 15 min) each				Spectrophotomer	
de Paula et al. G1: Ascorbic acid + in- [24] Office 35% HP <sup>g</sup> 1 week-interval [18–45] darker Classical <sup>e</sup> VAS 0-10 G2: Placebo + in- Office (3 × 15 min) each de Paula et al. G1: Etoricoxib + in- [25] Office 1 week-interval [18–42] darker Classical <sup>e</sup> NRS 0-4 [26] Vita NRS 0-4 (3 × 15 min) each 1 week-interval [18–42] darker Classical <sup>e</sup> NRS 0-4 [26] Vita NRS 0-4 (18–45] VAS 0-10 Spectrophotomer <sup>f</sup> VAS 0-10 Spectrophotomer <sup>f</sup> VAS 0-10 Spectrophotomer <sup>f</sup> VAS 0-10		G3. III-Office 35%		33% HP	(5 × 15 mm) each					
de Paula et al.   G1: Ascorbic acid + in-   Parallel   G1 and G2:   2 sessions,   39 [15] <sup>a</sup> 26.8 ± 8.2   C2 or   SGU Vita   NRS 0-4     [24]   Office   35% HP <sup>g</sup> 1 week-interval   [18–45]   darker   Classical <sup>e</sup> VAS 0-10     [27]   G2: Placebo + in-   45 min   50 [33 × 15 min ) each   50 [30]   25.5 ± 6.4   C2 or   SGU Vita   NRS 0-4     [26]   Office   1 week-interval   2 sessions,   30 [30]   25.5 ± 6.4   C2 or   SGU Vita   NRS 0-4     [25]   Office   1 week-interval   [18–42]   darker   Classical <sup>e</sup> NRS 0-100     [25]   Office   45 min   1 week-interval   [18–42]   darker   Cassical <sup>e</sup> NRS 0-100     [25]   Office   45 min   50 [10]   Spectrophotomer <sup>f</sup> VAS 0-100     [26]   Placebo + in-   45 min   50 [10]   Spectrophotomer <sup>f</sup> VAS 0-100		HP+LED/Laser <sup>n</sup>								
[24]   Office   35% HP <sup>g</sup> 1 week-interval   [18–45]   darker   Classical <sup>e</sup> VAS 0-10     G2: Placebo + in- Office   45 min   5 min each	de Paula et al. [24]	G1: Ascorbic acid + in-	Parallel	G1 and G2:	2 sessions,	39 [15] <sup>a</sup>	$26.8\pm8.2$	C2 or	SGU Vita	NRS 0-4
G2: Placebo + in- Office 45 min (3 × 15 min) each Spectrophotomer'   de Paula et al. G1: Etoricoxib + in- Parallel Parallel 35% HP <sup>g</sup> 2 sessions, 1 week-interval 30 [30] 25.5 ± 6.4 C2 or darker SGU Vita NRS 0-4   [25] Office 1 week-interval [18-42] darker Classical <sup>e</sup> NRS 0-100   G2: Placebo + in- 45 min 45 min VAS 0-10		Office		35% HP <sup>g</sup>	1 week-interval		[18-45]	darker	Classical <sup>e</sup>	VAS 0-10
de Paula et al. G1: Etoricoxib+in- [25] Office 1 week-interval [18–42] darker Classical <sup>e</sup> NRS 0–4 G2: Placebo+in- G2: Pla		G2: Placebo + in-			$45 \min$				Spectrophotomer'	
[25] Office 1 week-interval [18–42] darker Classical <sup>e</sup> NRS 0–100 G2: Placebo + in- 45 min Spectrophotomer <sup>f</sup> VAS 0–10	de Paula et al.	G1: Ftoricoxib+in-	Parallel	35% HP <sup>g</sup>	$(5 \times 15 \text{ mm})$ each 2 sessions	30 [30]	$255 \pm 64$	C2 or	SGU Vita	NRS 0-4
G2: Placebo + in- 45 min Spectrophotomer <sup>f</sup> VAS 0–10	[25]	Office	i uiuiici	55/6111	1 week-interval	50 [50]	[18-42]	darker	Classical <sup>e</sup>	NRS 0-100
		G2: Placebo+in-			45 min		. ,		Spectrophotomer <sup>f</sup>	VAS 0-10
Office $(3 \times 15 \text{ min})$ each		Office			$(3 \times 15 \text{ min})$ each					
Paula et al. G1: In-Office + Parallel 35% HP <sup>s</sup> 2 sessions, 30 [24] <sup>4</sup> 29.6 $\pm$ 8.3 C2 or SGU Vita NRS 0-4	Paula et al.	G1: In-Office +	Parallel	35% HP <sup>g</sup>	2 sessions,	30 [24] <sup>4</sup>	$29.6 \pm 8.3$	C2 or	SGU Vita	NRS 0-4
[20] Induction I week-interval $[10-20]$ datker Classical VAS 0-10 $G2^{\circ}$ In-Office + 45 min Spectrophotomer <sup>f</sup>	[20]	G2: In-Office +			45 min		[0-01]	udrker	Spectrophotomer <sup>f</sup>	VAS U-10
Placebo (3 × 15 min) each		Placebo			$(3 \times 15 \text{ min})$ each				spectrophotomer	

CP: Carbamide peroxide; HP: hydrogen peroxide; SGU: shade guide units; NRS: numeric rating scale; VAS: visual analog scale; LED: Light-emitting diode.

<sup>a</sup> Less data than the original study was used due to missing information.

<sup>b</sup> Data from this group (combined at-home+in-office bleaching) was not added in this regression analysis as this could not be compared to the other groups.

<sup>c</sup> Only data from the Brazil center was added to this analysis to standardize the same population in all studies.

<sup>d</sup> Whiteness Perfect 16%, FGM, Joinville, Santa Catarina, Brazil.

<sup>e</sup> Vitapan Classical, Vita Zahnfabrik, Bad Säckingen, Germany.

<sup>f</sup> Vita Easyshade, Vita Zahnfabrik, Bad Säckingen, Germany.

- <sup>g</sup> Whiteness HP Maxx 35%, FGM, Joinville, Santa Catarina, Brazil.
- <sup>h</sup> Vita Bleachedguide 3D-Master, Vita Zahnfabrik, Bad Säckingen, Germany.
- <sup>i</sup> Mix One Supreme 35%, FGM, Joinville, Santa Catarina, Brazil.

<sup>j</sup> Mix Day 6%, Villevie, Joinville, Santa Catarina, Brazil.

<sup>k</sup> Whiteness HP Blue 35%, FGM, Joinville, Santa Catarina, Brazil.

<sup>1</sup> Whiteness HP Blue 20%, FGM, Joinville, Santa Catarina, Brazil.

<sup>m</sup> Whiteness Perfect 10%, FGM, Joinville, Santa Catarina, Brazil.

<sup>n</sup> Whitening Lase Light Plus, DMC Odontológica, São Carlos, São Paulo, Brazil.

<sup>o</sup> The 20% HP gel was produced exclusively for this study by FGM company, keeping the same characteristics of the Whiteness HP Maxx gel<sup>b</sup>.

Understanding of patient-related variables that can affect dental bleaching, such as age, gender and baseline tooth color, as well as those that can predispose bleaching-induced tooth sensitivity can help predict patient response to treatment and allow clinicians to determine the best treatment modality for each individual. Additionally, clinicians may set appropriate expectations to avoid disappointments and frustrations during treatment.

As the individual clinical trials published in the literature do not have a high sample size to allow for such predictions, pooling data Download English Version:

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