



INTRODUCTION

Accurate and reproducible tooth shade determination is essential in dentistry, as even minor color discrepancies can compromise diagnosis and treatment success [1]. However, shade selection remains a clinical challenge due to its inherent subjectivity and variability among clinicians [2-4]. Currently, several methods are available for tooth color determination, including both manual and instrumental approaches [5-6]. The Optishade Style Italiano TM (OSI, Smile Line, St-Imier, Switzerland) is an instrumental colorimeter designed to reduce such subjectivity and variability [7-9]. Despite its introduction in 2015, no in vivo studies have yet evaluated its reliability.

AIMS

This pilot study aimed to evaluate the **reliability of the OSI colorimeter for tooth color measurement** in Dentistry, based on the L*, a*, and b* parameters of the CIELab system.

MATERIALS AND METHODS

Egas Moniz University Clinic

- In the same clinical space (one box)
- Between 3 and 6 pm
- Feb - May

This box was chosen because it was located near a window so that there would be light coming from a natural source.



40 patients

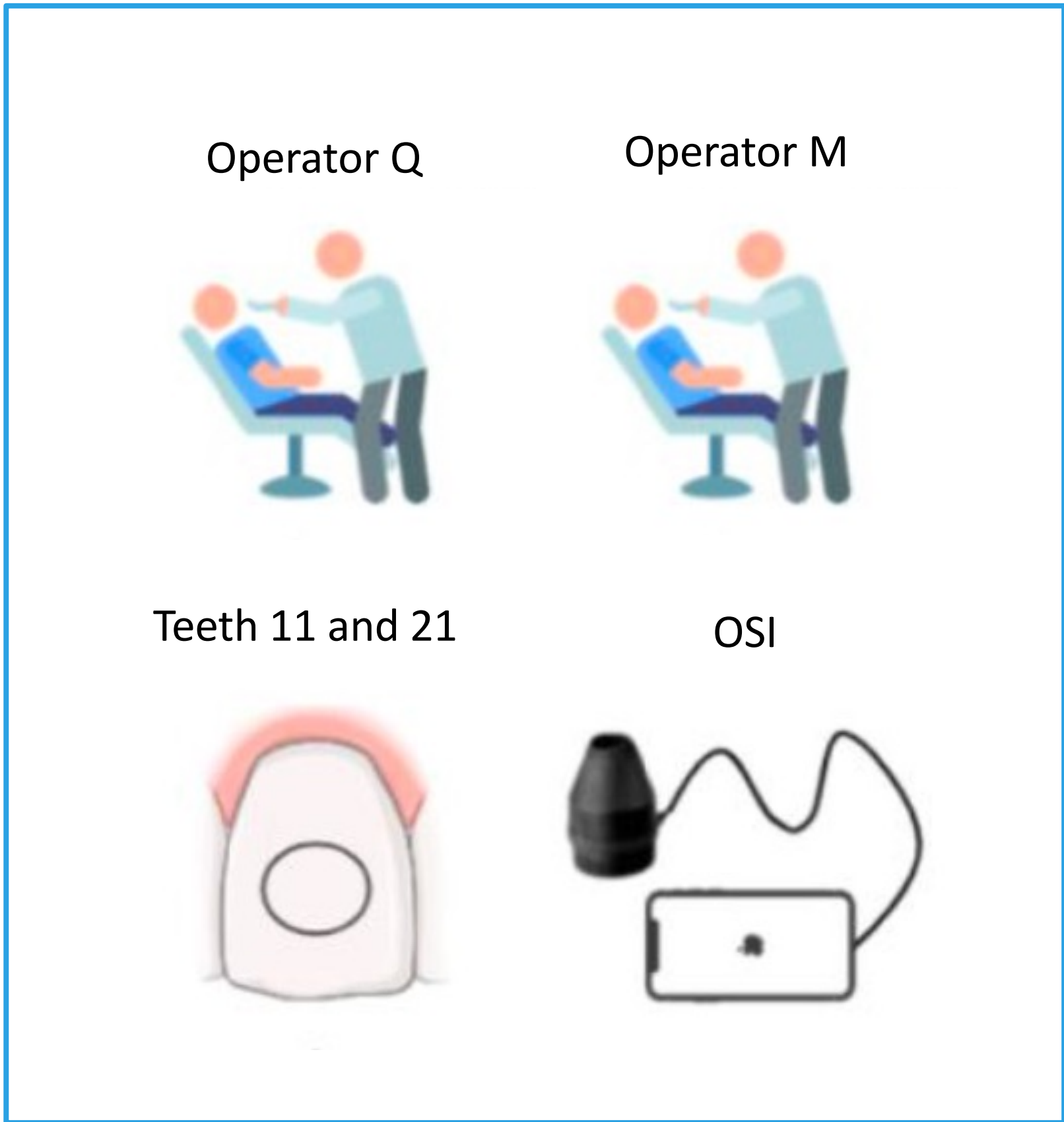
1. Patient recruitment.
2. Patient selection according to inclusion and exclusion criteria:



- Prior consent;
- Adults (>18 years);
- All teeth of the 2nd sextant.



- Makeup and lipstick;
- Restorations;
- No prior bleaching treatments;
- Stains, tartar, fluorosis, hypoplasia;
- Pregnant women;
- Smoking habits;
- Ongoing orthodontic treatment;
- Use of mouthwash and/or mouthwash or color-modifying medications;
- Non-vital teeth, with developmental anomalies or anatomically altered.



3. Explanation of the procedures to be performed with delivery and signature of the informed consent form.
4. Connection and calibration of the OSI according to the manufacturer's instructions: connecting to the iPhone, download and open the Optishade® app, press the main button on your device for 3 s, place the white background calibration cap and click on calibrate-
5. Color measurement: OSI placement close to the tooth at 90° in relation to the vestibular surface of the maxillary anterior incisors (teeth 11 and 21) by two calibrated operators (operator Q and M).
6. L*, a*, and b* values recorded in three thirds (cervical, middle and incisal).
7. Repeated measurements by each operator seven days later (Q2 and M2).
8. Intra- and inter-operator reliability assessment using the intraclass correlation coefficient (ICC) [IBM SPSS Statistics software v. 28.0 (IBM Corp., Armonk, NY, USA)].

RESULTS

For the L* and a* parameters of the CIELab system, the concordance between appointments and operators showed ICC values between 0.5 and 0.75, indicating a moderate reliability of the instrument. In contrast, higher ICC values were obtained for b*, reflecting excellent reliability for this parameter (Tables 1 and 2).

Table 1. Determination of the intraclass correlation coefficient (ICC) between the two appointments of each operator (results indicated with confidence interval, 95% CI).

Operator	L*		a*		b*	
	ICC	[-CI 95%-]	ICC	[-CI 95%-]	ICC	[-CI 95%-]
	Reliability		Reliability		Reliability	
Q1-Q2	0.535	[0.270;0.724]	0.653	[0.435;0.799]	0.895	[0.811;0.943]
	Moderate		Moderate		Good	
M1-M2	0.650	[0.428;0.798]	0.641	[0.415;0.792]	0.900	[0.819;0.946]
	Moderate		Moderate		Excellent	

Table 2. Determination of the intraclass correlation coefficient (ICC) between the two operators for each appointment (results indicated with confidence interval, 95% CI).

Operator	L*		a*		b*	
	ICC	[-CI 95%-]	ICC	[-CI 95%-]	ICC	[-CI 95%-]
	Reliability		Reliability		Reliability	
Q1-M1	0.491	[0.346;0.761]	0.700	[0.447;0.840]	0.900	[0.819;0.945]
	Moderate		Moderate		Good	
Q2-M2	0.564	[0.314;0.742]	0.691	[0.488;0.823]	0.956	[0.918;0.976]
	Moderate		Moderate		Excellent	

CONCLUSIONS

The OSI colorimeter, when used to evaluate the parameters of the CIELab system for color measurement in Dentistry, demonstrated greater reliability for the b* parameter, while its reliability was only moderate for the L* and a* parameters. These findings support the potential of OSI as a useful tool in clinical shade determination. Future studies should include comparisons with other visual and instrumental methods and assess reliability across different thirds. Expanding the demographic diversity of participants will further validate the device for broader clinical use.

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