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# Dry Eye after Small Incision Lenticule Extraction (SMILE) versus Femtosecond Laser-Assisted in Situ Keratomileusis (FS-LASIK) for Myopia: A Meta-Analysis

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### Abstract

#### Purpose

To compare dry eye after small incision lenticule extraction (SMILE) and femtosecond laserassisted LASIK (FS-LASIK) for correcting myopia.

#### Methods

CENTRAL, Embase and PubMed were searched in November 2016. All randomized controlled trials (RCTs) and prospective cohorts that compared dry eye after SMILE with FS-LASIK were selected.

#### Results

Five cohorts and one RCT were identified for comparing dry eye after SMILE (291 eyes) and FS-LASIK (277 eyes). The pooled results revealed that the SMILE and FS-LASIK groups did not differ significantly in terms of Schirmer's I test (SIT) and tear film osmolarity (TFO) at any postoperative visits. By contrast, tear break up time (TBUT; p = 0.04 for one month, p < 0.001 for three months, and p = 0.02 for six months) and ocular surface disease index (OSDI; p < 0.001 for one month and three months, and p = 0.006 for six months) were significantly worse in the FS-LASIK group than in the SMILE group at follow-up. At six months postoperatively, TBUT and TFO values in both the SMILE and FS-LASIK groups and OSDI scores in the SMILE group returned to preoperative levels, but SIT values in both groups (p = 0.02 for the SMILE group and p < 0.001 for the FS-LASIK group) and OSDI in the FS-LASIK group (p < 0.001) were still statistically impaired.

#### Conclusion

Dry eye after both SMILE and FS-LASIK usually occurs transiently. SMILE does not show obvious superiority over FS-LASIK by exhibiting similar and acceptable objective parameters, and SMILE may have milder subjective symptoms.



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#### Introduction

Refractive surgery, such as laser-assisted in situ keratomileusis (LASIK), allows people to reduce their dependence on glasses. Although high satisfaction is reported, dry eye remains the most common complication after LASIK; the incidence varies among patients [1–5]. Some patients experienced transient dry eye, while others reported severe symptoms over the long term, with incidence ranging from 20% to 40% [2]. It is thus clear that a significant number of patients are at risk for developing chronic dry eye disease, further affecting the health status of this robust population [6].

Total amputation of the corneal nerves due to flap creation and photoablation is a likely cause of post-LASIK dry eye [2,7]. Traditionally, the flap is created using mechanical microkeratomes, but femtosecond laser technology has become increasingly common [8]. Femtosecond laser-assisted LASIK (FS-LASIK) generates more consistent and predictable flap diameters, thicknesses, and hinge widths than microkeratomes [9]. The control and optimization of corneal features may reduce flap-related complications such as reduced corneal nerve injury and encourage faster recovery from dry eye [9–11].

With the introduction of the femtosecond laser platform (VisuMax, Carl Zeiss Meditec AG, Jena, Germany), small incision lenticule extraction (SMILE) emerged as a novel, all-inone refractive surgery for myopia. It is a flapless procedure in which an intrastromal lenticule is created between two photodisruption planes and removed mechanically from an arcuate side cut of 3 to 4 mm [12], which is much shorter than the length of a standard LASIK flap. This minimally invasive approach was intended to preserve corneal nerves more successfully and result in lower incidence of dry eye than found with FS-LASIK and traditional LASIK [13].

Recent studies have compared dry eye after SMILE and FS-LASIK [6,12,14–17]. Some studies supported the position that SMILE reduced the incidence of dry eye disease when compared with FS-LASIK [6,14,15,17], but others reported no differences in dry eye parameters between these two groups [12,16]. One meta-analysis cited dry eye as a primary outcome when comparing SMILE and FS-LASIK [5]. Only two to four studies were included in each comparison of this meta-analysis [6,12,14,15], and the comparisons and follow-up durations were neither adequate nor complete. Uncertainty remains because the results are controversial and the sample sizes remain very small. Thus, a meta-analysis was performed to compare dry eye after SMILE versus FS-LASIK at different follow-up periods.

#### **Materials and Methods**

#### Search strategy

The systematic review and meta-analysis was performed in accordance with PRISMA guidelines. The PubMed, Embase, and Cochrane Central Register of Controlled Trials (CEN-TRAL) were searched independently by two reviewers for records that compared dry eye after SMILE and LASIK. The search terms were related to LASIK (e.g., 'Keratomileusis, Laser In Situ' and 'LASIK') and SMILE (e.g., 'lenticule extraction' and 'SMILE'). <u>S1 Appendix</u> shows the PubMed search process in detail. No date restrictions were applied in the electronic search for trials; the last search was run on November 14, 2016. The search was limited to English-language papers. Titles and abstracts were independently screened by two reviewers, after which potentially relevant reports were retrieved as complete manuscripts and assessed for compliance with inclusion criteria. Discrepancies between the reviewers were resolved by discussion.

#### Inclusion criteria and exclusion criteria

The following selection criteria were used to identify studies for inclusion in this meta-analysis: 1) study design: randomized controlled trials (RCTs) and cohort studies; 2) population: participants with stable myopia or myopic astigmatism and without ocular diseases, especially dry eye disease; 3) intervention: SMILE versus FS-LASIK, the use of standard surgical techniques. SMILE was performed using a femtosecond laser (VisuMax) with a 100–120  $\mu$ m thick cap and a 6.0–6.6 mm diameter lenticule. For the FS-LASIK group, the corneal flap was made by a femtosecond laser with a 90–110  $\mu$ m thick and 7.9–9.0 mm diameter flap, and a 50° superior hinge. Excimer photoablation was performed in a 6.0–6.5 mm optical zone; 4) outcome: dry eye parameters. Letters, review articles, animal or laboratory studies, and conference abstracts were all excluded.

#### Outcome measures

The outcome measures for inclusion were ocular surface disease index (OSDI), tear breakup time (TBUT), Schirmer's I test (SIT), and tear film osmolarity (TFO) at one week, one month, three months, and six months postoperatively; at least one of the outcome measures was required for inclusion.

#### Data collection and quality assessment

Two reviewers independently collected the data and assessed the quality of studies. Any disagreements between the reviewers' results were resolved by discussion that involved a third reviewer when necessary. The following information was extracted from each study: first author, year of publication, study design, location, age of patients, number of eyes enrolled, preoperative spherical equivalent, preoperative dry eye parameters (OSDI, TBUT, SIT, and TFO), surgical procedures, follow-up duration, and outcome data. Studies with incomplete data were also included; authors were contacted to provide sufficient information when necessary. We contacted four authors, and one responded [6].

The quality of RCTs was assessed using the Jadad Scale [18], while the Newcastle-Ottawa Scale (NOS) was adopted to evaluate each cohort [19]. The Jadad scale features three principal assessment domains: randomization, blinding, and participant dropout. Appropriate randomization and blinding scored two points each, and total scores ranged from zero to five. Studies scoring fewer than three points were considered to be of low quality. The maximum NOS score is nine, based on assessing three areas: selection quality (maximum four points), comparability (maximum two points), and outcome measures (maximum three points). Studies scoring five or fewer points were considered to be of low quality [3].

#### Statistical analysis

RevMan software (version 5.3; Cochrane Collaboration, Oxford, United Kingdom) was used to analyze the data. The mean difference (MD) and corresponding 95% confidence interval (CI) were calculated for continuous outcomes; p < 0.05 was considered statistically significant.

Statistical heterogeneity was tested using the chi-square-based Q-test and the I<sup>2</sup> statistic.  $I^2 > 50\%$  and p < 0.1 for the Q-test indicated significant heterogeneity, so the random effects model was used in those cases. Otherwise, the fixed effects model was used [20].

A sensitivity analysis was performed to evaluate the robustness of the results. In a leaveone-out cross-validation, each study in the meta-analysis was excluded in turn to investigate the influence of individual studies on the pooled estimates [21]. Publication bias was measured using a Begg funnel plot [22].

#### Results

#### Search results

The search found 72 citations, 34 of which were excluded by the initial search and screening of titles and abstracts. After further consideration of the remaining 38, we excluded 32 studies for following reasons: 29 did not provide the primary outcomes required for this meta-analysis, and three were not pertinent to SMILE or LASIK procedures. Five prospective cohort studies and one RCT were included in the final meta-analysis [6,12,14-17]. Fig 1 is a flow diagram detailing the search and selection process.

#### Study characteristics and quality

Six studies that reported on 291 eyes in the SMILE group and 277 eyes in the FS-LASIK group provided data for our meta-analysis. Four studies were conducted in China [14–17], one in Turkey [12], and one in France [6]. The six studies' main characteristics are described in Table 1, and their quality is assessed in Tables 2 and 3. The RCT scored only two because masking of surgeons is impossible and masking of patients was not reported [12]. The quality of the included cohorts was assessed by the NOS [6,14–17]. No selection bias was found in any of the studies. For comparability, most important factors were controlled in all studies. For outcome, one study had a twelve-month follow-up [16]. Total scores in all of the cohorts were above five, indicating a low risk of bias.

#### Outcome criteria

**TBUT.** All studies reported TBUT at one month and six months postoperatively [6,12,14–17]. An examination of the forest plot showed no statistically significant change in either the SMILE and FS-LASIK groups at six months (MD -0.62, 95% CI: -2.10 to 0.87, p = 0.42; MD -1.58, 95% CI: -3.29 to 0.14, p = 0.07) (Fig 2F and 2G, Table 4) postoperatively compared with preoperatively. Significantly higher TBUT scores were found in the SMILE group than in the LASIK group at all follow-up visits (MD 1.23, 95% CI: 0.05 to 2.41, p = 0.04 for one month; MD 0.66, 95% CI: 0.36 to 0.96, p < 0.001 for three months; and MD 0.89, 95% CI: 0.12 to 1.66, p = 0.02 for six months), except for one week after surgery (MD 0.52, 95% CI: -1.04 to 2.08, p = 0.51) (Fig 2B–2E, Table 4).

SIT. Five studies reported data for SIT scores at one month and six months postoperatively [6,12,14,15,17]. An examination of the forest plot demonstrated that statistically significant decreases in the SIT in both SMILE and FS-LASIK groups were found at six months postoperatively, compared with preoperative values (MD -1.38, 95% CI: -2.51 to -0.24, p = 0.02; MD -2.17, 95% CI: -3.11 to -1.23, p < 0.001) (Fig 3F and 3G, Table 4). No significant difference was found between the two groups in postoperative visits at one week (MD 2.02, 95% CI: -1.05 to 5.09, p = 0.20), one month (MD -0.71, 95% CI: -3.17 to 1.75, p = 0.57), three months (MD 0.83, 95% CI: -0.40 to 2.07, p = 0.19), and six months (MD 0.23, 95% CI: -0.66 to 1.11, p = 0.62) (Fig 3B-3E, Table 4).

**OSDI.** Three publications reported OSDI at one month and six months postoperatively [6,14,17]. An examination of the forest plot revealed significant increases in postoperative OSDI scores in the FS-LASIK group at six months (MD 5.57, 95% CI: 4.55 to 6.59, p < 0.001), but scores in the SMILE group returned to preoperative levels at six months (MD -0.67, 95% CI: -5.62 to 4.27, p = 0.79) (Fig 4E and 4F, Table 4). In addition, there was a significantly lower OSDI score in the SMILE group than in the FS-LASIK group at all time points (MD -5.49, 95% CI: -6.72 to -4.26, p < 0.001 for one month; MD -5.67, 95% CI: -6.77 to -4.57, p < 0.001 for





**Fig 1.** Flow chart showing literature search strategy. LASIK = laser in situ keratomileusis; SMILE = small incision lenticule extraction; FLEx = femtosecond lenticule extraction; RCTs = randomized controlled trials. *From*: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). *Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PloS Med* 6(7): e1000097. doi: 10.1371/journal.pmed1000097.

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Table 1. C	Situ Kerat

idy	Year	Design	Location			SMILE				FS-LASIK		Follow-up
			1	Eyes (n)	Age (y)	Preoperative SE (D)	Surgical Procedure	Eyes (n)	Age (y)	Preoperative SE (D)	Surgical Procedure	(E)
mirok al[12]	2013	Randomized	Turkey	28	26.2 ± 4.4	-4.0±1.4	VisuMax FS	58	26.2±4.4*	-3.9 ± 1.5	VisuMax FS and Schwind Amaris excimer laser	9
noyer al[6]	2015	Cohort (prospective)	France	30	31.1 ± 4.7	-4.65 ± 2.38	VisuMax FS	30	32.2 ± 7.5	-4.42 ± 1.78	IntraLase FS and Alleggretto excimer laser	9
et al[14]	2013	Cohort (prospective)	China	36	28.21 ± 7.04	-6.68 ± 1.34	VisuMax FS	30	27.33 ± 6.58	-7.96 ± 2.61	VisuMax FS and MEL-80 excimer laser	9
ang et al	2015	Cohort (prospective)	China	47	25.21 ± 6.51	-7.46 ± 1.11	VisuMax FS	43	24.72 ± 6.53	-7.44 ± 1.13	VisuMax FS and MEL-80 excimer laser	12
t et al[17]	2016	Cohort (prospective)	China	69	25.15±4.42	-5.04 ± 2.32	VisuMax FS	59	23.65 ± 3.87	-5.13 ± 1.36	VisuMax FS and Alleggretto excimer laser	9
et al[15]	2014	Cohort (prospective)	China	81	24.10±6.03	-5.70 ± 1.71	VisuMax FS	97	23.96 ± 5.14	-5.80 ± 2.01	VisuMax FS and MEL-80 excimer laser	9
, spherical	equiva	(prospective)	m, month; y	', year.								excimer laser

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\* The mean age of SMILE and FS-LASIK groups, no separate data provided.

Table 2. Jadad Scale for Randomized Controlled	Trials	(RCTs)
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Study	Randomization	Blinding	Withdraws	Sum of Score
Demirok et al[12] 2013	1	0	1	2

doi:10.1371/journal.pone.0168081.t002

three months; MD -6.88, 95% CI: -11.76 to -2.00, *p* = 0.006 for six months) (Fig 4B-4D, Table 4).

**TFO.** Two publications reported data for TFO [6,12]. There was no statistically significant change in either group at any time point postoperatively compared with preoperatively [12]. An examination of the forest plot revealed no significant differences between the two groups at one month (MD -5.00, 95% CI: -16.95 to 6.96, p = 0.41) and six months (MD -6.23, 95% CI: -22.60 to 10.13, p = 0.46) after surgery (Fig 5A and 5B, Table 4).

#### Sensitivity analysis and publication bias

The results of the leave-one-out analysis on the majority of outcomes showed that most exclusions did not alter the results of the previous analyses. After excluding Xia et al.'s study [17], heterogeneity was reduced in TBUT outcome ( $I^2$  from 74% to 0% for one week post-surgery and  $I^2$  from 88% to 49% for one month post-surgery) and OSDI outcome ( $I^2$  from 70% to 37% for six months post-surgery), but the pooled results remained unchanged. In the SIT outcome, heterogeneity was reduced ( $I^2$  from 80% to 0% for one week post-surgery) after excluding the study by Demirok et al. [12], and the pooled result showed that SIT scores were significantly higher in the SMILE group than in the FS-LASIK group in the remaining studies. No significant publication bias was demonstrated in the funnel plot.

#### Discussion

Given the popularity of refractive surgery and the prevalence of ocular dryness complaints after such procedures, we performed a meta-analysis to compare dry eye after SMILE versus FS-LASIK at one week, one month, three months, and six months postoperatively. According to the Dry Eye Workshop definition, dry eye disease is a multifactorial pathology that includes tear film changes with or without corneal damage, ocular symptoms, visual degradation, and decreased tear osmolarity, which together degrade quality of life [6]. Thus, a full and appropriate evaluation composed of tear film quality (as measured by TBUT and TFO), patient-reported, vision-related quality of life (as measured by OSDI), and the quantity of tear fluid (as measured by SIT) was adopted.

Table 3. Newcastle–Ottawa Scale for O	bservational Studies (	cohorts)
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Study	Selection	Comparability	Outcome	Total score
Denoyer et al[6] 2015	****	**	**	8
Li et al[14] 2013	****	*	**	7
Wang et al[16] 2015	****	**	***	9
Xia et al[17] 2016	****	**	**	8
Xu et al[15] 2014	****	*	**	7

A higher overall score corresponds to a lower risk of bias; a score of five or less (out of nine) indicates a high risk of bias. Each \* equals 1 point.

_	Study or Subaroup	Mean	SD	Total	Mean	-LASIF SD	Total	Weight	Mean Difference	Mean Difference
	Demirok 2013	Q	12	28	9.1	1	28	38.1%	-0.10[-0.68.0.48]	
	11 2013	8 5 8	1 12	38	7 88	5 57	33	2 3%	0.70 [-1.66, 3.06]	
	Wang 2015	0.90	1 57	47	0.56	1 35	12	25.0%	0.70 [-1.00, 5.00]	
	Yia 2016	6.8	1.57	69	7.8	3.3	59	10.5%	-1 00 [-2 10 0 10]	
	Xii 2014	10 35	3 28	81	11 00	3 15	97	14 1%	-0.74 [-1.69 0.21]	
	Xu 2014	10.55	5.20	01	11.09	5.15	57	14.1/0	-0.74 [-1.09, 0.21]	
	Total (95% CI)			263			260	100.0%	-012[-048 023]	
	Hotorogeneity Chi <sup>2</sup>	6.51 d	6 4 /	P 0 1	6), 12	2.00/	200	100.078	-0.12 [-0.40, 0.25]	
	Test for overall effect	= 6.51, a	T = 4 (	P = 0.1	(6); I <sup>_</sup> =	39%				-10 -5 0 5 3
	Test for overall effect	L Z = 0.0	56 (F =	0.50)						Favours [SMILE] Favours [FS-LASIK]
3			MILE		FS.	-1 4516			Mean Difference	Mean Difference
_	Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% Cl	I IV, Random, 95% CI
	Demirok 2013	9.9	2.8	28	10.1	2.3	28	33.8%	-0.20 [-1.54, 1.14]	
	LI 2013	4.32	3.57	37	4.7	3.65	32	29.3%	-0.38 [-2.09, 1.33]	
	Ald 2010	0.4	5.1	69	4.5	5.2	29	30.9%	1.90 [0.80, 5.00]	
	Total (95% CI)			134			119	100.0%	0 52 [-1 04 2 08]	
	Heterogeneity: Tau <sup>2</sup> =	= 1 40.0	$hi^2 =$	7 83 d	f = 2 (P)	P = 0.0	$(2) \cdot 1^2 =$	74%		· ++
	Test for overall effect	t: Z = 0.0	66 (P =	= 0.51)		- 0.0		1 170		-10 -5 0 5 Favours [SMILE] Favours [FS-LASIK]
-										
	Study or Subgroup	Moon	MILE	Total	FS-	-LASIK	Total	Woight	Mean Difference	Mean Difference
-	Domirok 2012	10.0	2.0	20	10.7	2.4	20	16.0%	0 20 [ 1 17 1 57	
	Denover 2015	10.9	1.7	20	E 1	1.0	20	10.0%	0.20 [-1.17, 1.57]	
	11 2012	5.9	1.1	30	2.1	2.01	30	10.2%	1 01 [0 04 3 70]	1
	Wang 2015	5.08	1 25	37	6.52	1 24	13	10.6%	_0.25 [_0.70 0.20]	-
	Xia 2016	0.28	1.33	47 60	4.2	2 /	40	14 00/	5 50 12 74 7 26	; <u>1                                    </u>
	Aia 2010	9.7	0.5	01	4.2	2.4	59	19 00/	0.20 [3.74, 7.26]	
	Au 2014	0.79	2.25	81	0.41	2.96	97	18.8%	0.38 [-0.39, 1.15]	1 Te
	Total (95% CI)			292			288	100.0%	1.23 [0.05. 2.41]	
	Heterogeneity: Tau <sup>2</sup> -	= 1.78.0	Chi <sup>2</sup> =	41.18	df = 5	(P < 0	.00001	): $ ^2 = 88^{\circ}$	%	· + +
	Test for overall effect	t: Z = 2.0	04 (P =	= 0.04)				,, , = 00.		-10 -5 Ó Ś Favours [SMILE] Favours [FS-LASIK]
)			5MII E		EF	-1 461	ĸ		Mean Difference	Maan Difference
	Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Fixed, 95% CI	IV, Fixed, 95% CI
-	Demirok 2013	11.6	2.8	28	10.9	2.8	28	4.2%	0.70 [-0.77, 2.17]	
	Li 2013	5.03	3.83	36	4.43	4.22	30	2.4%	0.60 [-1.36, 2.56]	
	Wang 2015	8.21	0.95	47	7.42	0.96	43	57.9%	0.79 [0.39. 1.19]	
	Xia 2016	6	2.2	69	5.1	2.2	59	15.5%	0.90 [0.14, 1.66]	
	V 2014	F 70	2 20	91	5.67	2.1.4		20.10		
	XU 2014	5.79	2.30	01	5.07	2.14	97	20.1%	0.12 [-0.55, 0.79]	
	Total (95% CI) Heterogeneity: Chi <sup>2</sup> = Test for overall effect	= 3.29, c t: Z = 4.	df = 4 33 (P -	261 (P = 0. < 0.000	51); l <sup>2</sup> =	2.14	97 257	100.0%	0.12 [-0.55, 0.79] 0.66 [0.36, 0.96]	-10 -5 0 5 Favours [SMILE] Favours [FS-LASIK]
Ξ	Total (95% CI) Heterogeneity: Chi <sup>2</sup> = Test for overall effect	= 3.29, c t: Z = 4.	2.38 df = 4 33 (P -	261 (P = 0.1 < 0.000	51); I <sup>2</sup> = 01) FS-	2.14 = 0% -LASIk	257	20.1%	0.12 [-0.55, 0.79] 0.66 [0.36, 0.96] Mean Difference	-10 -5 0 5 Favours [SMILE] Favours [FS-LASIK] Mean Difference
Ξ_	Total (95% CI) Heterogeneity: Chi <sup>2</sup> = Test for overall effect Study or Subgroup	= 3.29, c t: Z = 4.	2.38 df = 4 33 (P -	261 (P = 0.) < 0.000	51); I <sup>2</sup> = 01) FS- Mean	2.14 = 0% -LASIk SD	97 257 Total	20.1% 100.0% Weight	0.66 [0.36, 0.96] 0.66 [0.36, 0.96] Mean Difference IV, Random, 95% Cl	-10 -5 0 5 Favours [SMILE] Favours [FS-LASIK] Mean Difference IV, Random, 95% Cl
-	Total (95% Cl) Heterogeneity: Chi <sup>2</sup> = Test for overall effect Study or Subgroup Demirok 2013	= 3.29, c t: Z = 4. <u>Mean</u> 11.1	2.58 df = 4 33 (P - SMILE SD 2.7	261 (P = 0.) < 0.000 Total	51); I <sup>2</sup> = 01) FS- <u>Mean</u>	2.14 = 0% -LASIk SD 2.5	97 257 <u>Total</u> 28	20.1% 100.0% Weight 13.3%	0.12 [-0.55, 0.79] 0.66 [0.36, 0.96] Mean Difference IV, Random, 95% Cl 0.70 [-0.66, 2.06]	-10 -5 0 5 Favours [SMILE] Favours [FS-LASIK] Mean Difference I IV, Random, 95% CI
Ξ	Total (95% CI) Heterogeneity: Chi <sup>2</sup> = Test for overall effect Study or Subgroup Demirok 2013 Denoyer 2015	= 3.29, c t: Z = 4. <u>Mean</u> 11.1 7	2.38 df = 4 33 (P - 5MILE 5D 2.7 1.8	261 (P = 0 < 0.000 Total 28 30	51); I <sup>2</sup> = 01) FS- Mean 10.4 5.2	-LASIk 5D 2.5 1.8	97 257 <u>Total</u> 28 30	20.1% 100.0% Weight 13.3% 17.3%	0.12 [-0.55, 0.79] 0.66 [0.36, 0.96] Mean Difference IV, Random, 95% CI 0.70 [-0.66, 2.06] 1.80 [0.89, 2.71]	-10 -5 Favours [SMILE] Favours [FS-LASIK] Mean Difference IV, Random, 95% CI
Ξ	Total (95% Cl) Heterogeneity: Chi <sup>2</sup> = Test for overall effect Study or Subgroup Demirok 2013 Denoyer 2015 Li 2013	= 3.29, c t: Z = 4. <u>Mean</u> 11.1 7 7.06	2.38 df = 4 33 (P - 5MILE 5D 2.7 1.8 3.85	261 (P = 0.: < 0.000 Total 28 30 36	51); I <sup>2</sup> = 51); I <sup>2</sup> = 101 10.4 5.2 4.97	2.14 = 0% -LASIk SD 2.5 1.8 3.57	97 257 Total 28 30 30	20.1% 100.0% Weight 13.3% 17.3% 10.2%	0.12 [-0.55, 0.79] 0.66 [0.36, 0.96] Mean Difference IV, Random, 95% CI 0.70 [-0.66, 2.06] 1.80 [0.89, 2.71] 2.09 [0.30, 3.88]	-10 -5 - 0 -5 Favours [SMILE] Favours [FS-LASIK]  Mean Difference IV, Random, 95% CI I I I I I I I I I I I I I I I I I I
Ξ_	Total (95% CI) Heterogeneity: Chi <sup>2</sup> = Test for overall effect Study or Subgroup Demirok 2013 Denoyer 2015 Li 2013 Wang 2015	5.79 = 3.29, c t: Z = 4. <u>S</u> <u>Mean</u> 11.1 7 7.06 9.57	2.38 df = 4 33 (P - 5MILE 5D 2.7 1.8 3.85 0.93	261 (P = 0.1 < 0.000 Total 28 30 36 47	51); I <sup>2</sup> = 51); I <sup>2</sup> = 101 10.4 5.2 4.97 8.19	2.14 = 0% -LASIK SD 2.5 1.8 3.57 1.45	97 257 257 28 30 30 43	20.1% 100.0% Weight 13.3% 17.3% 10.2% 20.7%	0.12 [-0.55, 0.79] 0.66 [0.36, 0.96] 10, 0.66 [0.66, 2.06 1.80 [0.89, 2.71] 2.09 [0.30, 3.88] 1.38 [0.87, 1.89]	-10 -5 0 5 Favours [SMILE] Favours [FS-LASIK] Mean Difference IV, Random, 95% Cl
E	Total (95% CI) Heterogeneity: Chi <sup>2</sup> = Test for overall effect Study or Subgroup Demirok 2013 Denoyer 2015 Li 2013 Wang 2015 Xia 2016	5.79 = 3.29, c t: Z = 4. <u>S</u> <u>Mean</u> 11.1 7 7.06 9.57 6.3	2.38 df = 4 33 (P - 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	<b>261</b> (P = 0.) < 0.000 <b>Total</b> 28 30 36 47 69	51); I <sup>2</sup> = 51) FS- Mean 10.4 5.2 4.97 8.19 6.6	2.14 = 0% -LASIK SD 2.5 1.8 3.57 1.45 1.6	97 257 257 28 30 30 43 59	20.1% 100.0% Weight 13.3% 17.3% 10.2% 20.7% 19.6%	0.12 [-0.55, 0.79] 0.66 [0.36, 0.96] Nean Difference IV, Random, 95% CI 0.70 [-0.66, 2.06] 1.80 [0.89, 2.71] 2.09 [0.30, 3.88] 1.38 [0.87, 1.89] -0.30 [-0.94, 0.34]	-10 -5 0 5 Favours [SMILE] Favours [FS-LASIK] Mean Difference IV, Random, 95% CI
Ξ	Total (95% CI) Heterogeneity: Chi <sup>2</sup> = Test for overall effect Study or Subgroup Demirok 2013 Denoyer 2015 Li 2013 Wang 2015 Xia 2016 Xu 2014	5.79 = 3.29, c t: Z = 4. <u>S</u> <u>Mean</u> 11.1 7 7.06 9.57 6.3 7.39	2.38 df = 4 33 (P - 5MILE 5D 2.7 1.8 3.85 0.93 2.1 2.36	<b>261</b> (P = 0.) < 0.000 <b>Total</b> 28 30 36 47 69 81	51); l <sup>2</sup> = 51); l <sup>2</sup> = 101 10.4 5.2 4.97 8.19 6.6 7.13	2.14 = 0% -LASIk SD 2.5 1.8 3.57 1.45 1.6 2.56	257 257 <u>Total</u> 28 30 30 43 59 97	20.1% 100.0% 13.3% 17.3% 10.2% 20.7% 19.6% 18.9%	0.12 [-0.55, 0.79] 0.66 [0.36, 0.96] Wean Difference IV, Random, 95% CI 0.70 [-0.66, 2.06 1.80 [0.89, 2.71] 2.09 [0.30, 3.88] 1.38 [0.87, 1.89 -0.30 [-0.94, 0.34 0.26 [-0.46, 0.98]	-10 -5 0 5 Favours [SMILE] Favours [FS-LASIK]  Mean Difference IV, Random, 95% CI I I I I I I I I I I I I I I I I I I
- 1	Total (95% CI) Heterogeneity: Chi <sup>2</sup> = Test for overall effect Study or Subgroup Demirok 2013 Denoyer 2015 Li 2013 Wang 2015 Xia 2016 Xu 2014 Total (95% CI)	5.79 = 3.29, c t: Z = 4. <u>Mean</u> 11.1 7 7.06 9.57 6.3 7.39	2.38 df = 4 33 (P - 5 MILE 5D 2.7 1.8 3.85 0.93 2.1 2.36	261 (P = 0.) < 0.000 Total 28 30 36 47 69 81 291	51); I <sup>2</sup> = 51); I <sup>2</sup> = 01) FS- Mean 10.4 5.2 4.97 8.19 6.6 7.13	2.14 = 0% -LASIk SD 2.5 1.8 3.57 1.45 1.6 2.56	97 257 Total 28 30 30 43 59 97 287	20.1% 100.0% Weight 13.3% 17.3% 10.2% 20.7% 19.6% 18.9%	0.12 [-0.55, 0.79] 0.66 [0.36, 0.96] IV, Random, 95% CI 0.70 [-0.66, 2.06 1.80 [0.89, 2.71] 2.09 [0.30, 3.88] 1.38 [0.87, 1.89] -0.30 [-0.94, 0.34] 0.26 [-0.46, 0.98] 0.80 [0.12, 1.66]	-10 -5 0 5 Favours [SMILE] Favours [FS-LASIK] Mean Difference IV, Random, 95% CI
	Total (95% CI) Heterogeneity: Chi <sup>2</sup> = Test for overall effect Study or Subgroup Demirok 2013 Denoyer 2015 Li 2013 Wang 2015 Xia 2016 Xu 2014 Total (95% CI) Heterogeneity: Tau <sup>2</sup> =	5.79 = 3.29, c t: Z = 4. <u>Mean</u> 11.1 7 7.06 9.57 6.3 7.39 = 0.68; c	df = 4 33 (P - <b>SMILE</b> <b>SD</b> 2.7 1.8 3.85 0.93 2.16 Chi <sup>2</sup> =	261 (P = 0.) < 0.000 Total 28 30 36 47 69 81 291 25.05.	51); I <sup>2</sup> = 51); I <sup>2</sup> = 51) FS- Mean 10.4 5.2 4.97 8.19 6.6 7.13 df = 5	2.14 = 0% -LASIK SD 2.5 1.8 3.57 1.45 1.6 2.56 (P = 0.100)	97 257 Total 28 30 43 59 97 287 .0001):	20.1% 100.0% 13.3% 17.3% 10.2% 20.7% 19.6% 18.9% 100.0%   <sup>2</sup> = 80%	0.12 [-0.55, 0.79] 0.66 [0.36, 0.96] IV, Random, 95% CI 0.70 [-0.66, 2.06 1.80 [0.89, 2.71] 2.09 [0.30, 3.88] 1.38 [0.87, 1.89] -0.30 [-0.94, 0.34 0.26 [-0.46, 0.98] 0.89 [0.12, 1.66]	-10 -5 Favours [SMILE] Favours [FS-LASIK] Mean Difference IV, Random, 95% CI
-	XII 2014         Total (95% CI)         Heterogeneity: Chi <sup>2</sup> Test for overall effect         Study or Subgroup         Demirok 2013         Denoyer 2015         Li 2013         Wang 2015         Xia 2016         Xu 2014         Total (95% CI)         Heterogeneity: Tau <sup>2</sup> =         Test for overall effect	5.79 = 3.29, c t: Z = 4. <u>Mean</u> 11.1 7 7.06 9.57 6.3 7.39 = 0.68; c t: Z = 2.2	2.38 df = 4 33 (P - 5MILE 5D 2.7 1.8 3.85 0.93 2.1 2.36 Chi <sup>2</sup> = 27 (P =	261 (P = 0 < 0.000 Total 28 30 36 47 69 81 291 25.05, = 0.02)	51); I <sup>2</sup> = 51); I <sup>2</sup> = 01) FS- Mean 10.4 5.2 4.97 8.19 6.6 7.13 df = 5	2.14 = 0% -LASIK SD 2.5 1.8 3.57 1.45 1.6 2.56 (P = 0.100)	97 257 Total 28 30 43 59 97 287 .0001);	20.1% 100.0% 13.3% 17.3% 10.2% 20.7% 19.6% 18.9% 100.0%   <sup>2</sup> = 80%	0.12 [-0.55, 0.79] 0.66 [0.36, 0.96] IV, Random, 95% CI 0.70 [-0.66, 2.06 1.80 [0.89, 2.71] 2.09 [0.30, 3.88 1.38 [0.87, 1.89] -0.30 [-0.94, 0.34 0.26 [-0.46, 0.98] 0.89 [0.12, 1.66]	-10 -5 Favours [SMILE] Favours [FS-LASIK] Mean Difference IV, Random, 95% CI I -10 -5 Favours [SMILE] Favours [FS-LASIK]
E -	Total (95% CI) Heterogeneity: Chi <sup>2</sup> Test for overall effect Study or Subgroup Demirok 2013 Denoyer 2015 Li 2013 Wang 2015 Xia 2016 Xu 2014 Total (95% CI) Heterogeneity: Tau <sup>2</sup> = Test for overall effect	5.79 = 3.29, c t: Z = 4. <u>Mean</u> 11.1 7.06 9.57 6.3 7.39 = 0.68; c t: Z = 2.2	df = 4 33 (P - SMILE SD 2.7 1.8 3.85 0.93 2.1 2.36 Chi <sup>2</sup> = 27 (P =	261 (P = 0 < 0.000 28 30 36 47 69 81 291 25.05, = 0.02)	51); I <sup>2</sup> = 51); I <sup>2</sup> = 101 10.4 5.2 4.97 8.19 6.6 7.13 df = 5	<b>-LASIk SD</b> 2.5 1.8 3.57 1.45 1.6 2.56 (P = 0)	97 257 Total 28 30 43 59 97 287 .0001);	20.1% 100.0% 13.3% 17.3% 10.2% 20.7% 19.6% 18.9% 100.0%   <sup>2</sup> = 80%	0.12 [-0.55, 0.79] 0.66 [0.36, 0.96] IV, Random, 95% CI 0.70 [-0.66, 2.06 1.80 [0.89, 2.71] 2.09 [0.30, 3.88] 1.38 [0.87, 1.89] -0.30 [-0.94, 0.34 0.26 [-0.46, 0.98] 0.89 [0.12, 1.66]	-10 -5 Favours [SMILE] Favours [FS-LASIK] Mean Difference IV, Random, 95% CI I -10 -5 Favours [SMILE] Favours [FS-LASIK]
E _	XU 2014         Total (95% CI)         Heterogeneity: Chi <sup>2</sup> Test for overall effect         Study or Subgroup         Demirok 2013         Demoyer 2015         Li 2013         Wang 2015         Xia 2016         Xu 2014         Total (95% CI)         Heterogeneity: Tau <sup>2</sup> =         Test for overall effect	= 3.29, c t: Z = 4. <u>S</u> <u>Mean</u> 11.1 7 7.06 9.57 6.3 7.39 = 0.68; C t: Z = 2.2	df = 4 33 (P - 33 (P - 33 (P - 50 (P - 2.7 1.8 3.85 0.93 2.1 2.36 Chi <sup>2</sup> = 27 (P = 50 (P - 50 (	261 (P = 0.) < 0.000 Total 28 30 36 47 69 81 291 25.05, = 0.02)	51); I <sup>2</sup> = 51); I <sup>2</sup> = 10.4 5.2 4.97 8.19 6.6 7.13 df = 5 Base	-LASIK SD 2.5 1.8 3.57 1.45 2.56 (P = 0.	97 257 Total 28 30 30 43 59 97 287 .0001);	20.1% 100.0% Weight 13.3% 17.3% 10.2% 20.7% 19.6% 18.9% 100.0%   <sup>2</sup> = 80%	0.12 [-0.55, 0.79] 0.66 [0.36, 0.96] 10, 0.66 [0.36, 0.96] 10, 0.70 [-0.66, 2.06 1.80 [0.89, 2.71] 2.09 [0.30, 3.88] 1.38 [0.87, 1.89] -0.30 [-0.94, 0.34 0.26 [-0.46, 0.98] 0.89 [0.12, 1.66]	-10 -5 Favours [SMILE] Favours [FS-LASIK] Mean Difference IV, Random, 95% CI -10 -10 -5 Favours [SMILE] Favours [FS-LASIK] Mean Difference IV Bandom Ofference
	Total (95% CI) Heterogeneity: Chi <sup>2</sup> = Test for overall effect Study or Subgroup Demirok 2013 Demoyer 2015 Li 2013 Wang 2015 Xia 2016 Xu 2014 Total (95% CI) Heterogeneity: Tau <sup>2</sup> = Test for overall effect Study or Subgroup Demirok 2013	= 3.29, c t: Z = 4. <b>Mean</b> 11.1 7 7.06 9.57 6.3 7.39 = 0.68; c t: Z = 2.3 <b>Six n</b> <u>Mean</u>	df = 4 33 (P - 500 - 50 - 3.85 0.93 2.1 2.36 Chi <sup>2</sup> = 2.7 (P = 50 - 7.7	261 (P = 0 < 0.000 Total 28 30 36 47 69 81 291 25.05, \$ \$ 0.02)	51); I <sup>2</sup> = 51); I <sup>2</sup> = 101 10.4 4.97 8.19 6.6 7.13 df = 5 Base	-LASIk SD 2.5 1.8 3.57 1.45 1.6 2.56 (P = 0)	97 257 257 28 30 30 43 30 43 30 97 287 00001); 287 00001);	20.1% 100.0% Weight 13.3% 17.3% 10.2% 20.7% 18.9% 100.0%   <sup>2</sup> = 80% N (eight [V]	0.12 [-0.55, 0.79] 0.66 [0.36, 0.96] Mean Difference IV, Random, 95% CI 0.70 [-0.66, 2.06] 1.80 [0.89, 2.71] 2.09 [0.30, 3.88] -0.30 [-0.94, 0.34] 0.26 [-0.46, 0.98] 0.89 [0.12, 1.66] Mean Difference f, Random, 95% CI 2.10 [10, 3, 20]	-10 -5 Favours [SMILE] Favours [FS-LASIK] Mean Difference IV, Random, 95% CI -10 -5 Favours [SMILE] Favours [FS-LASIK] Mean Difference IV, Random, 95% CI
	XU 2014         Total (95% Cl)         Heterogeneity: Chi <sup>2</sup> =         Test for overall effect         Study or Subgroup         Demirok 2013         Denoyer 2015         Li 2013         Wang 2015         Xia 2016         Xu 2014         Total (95% Cl)         Heterogeneity: Tau <sup>2</sup> =         Test for overall effect         Study or Subgroup         Demirok 2013         Li 2013	5.79 = 3.29, c t: Z = 4. <u>Similar 11</u> 7 7.06 9.57 6.3 7.39 = 0.68; c t: Z = 2.3 <u>Six n</u> <u>Mean</u> 11.1 7 7.06	2.30 df = 4 33 (P - 50 2.7 1.8 3.85 2.1 2.36 2.7 (P = 2.7 (P = 50 1 2.7 2.3 8 50 1 2.7	261 (P = 0 < 0.000 Total 28 30 36 47 69 81 291 291 225.05, 5 6 0.02)	5.07 FS- Mean 10.4 5.19 6.6 7.13 df = 5 Base <u>4ean</u> 9	2.14 <b>-LASIk SD</b> 2.5 1.8 3.57 1.45 2.56 (P = 0. <b>eline SD</b> T 1.2 42	97 257 257 28 30 30 43 59 97 287 (0001); 287 0001); 287 38	20.1% 100.0% 13.3% 17.3% 10.2% 20.7% 19.6% 19.6% 18.9% 100.0%   <sup>2</sup> = 80%	0.12 [-0.55, 0.79] 0.66 [0.36, 0.96] Mean Difference IV, Random, 95% CI 2.09 [0.30, 3.88] 1.38 [0.87, 1.89] -0.30 [-0.94, 0.34] 0.26 [-0.46, 0.98] 0.89 [0.12, 1.66] Mean Difference f, Random, 95% CI 2.10 [1.01, 3.19] 152 [2.44] 0.277	-10 Favours [SMILE] Favours [FS-LASIK] Mean Difference IV, Random, 95% CI -10 -5 Favours [SMILE] Favours [FS-LASIK] Mean Difference IV, Random, 95% CI
2 -	XII 2014         Total (95% CI)         Heterogeneity: Chi <sup>2</sup> =         Test for overall effect         Study or Subgroup         Demirok 2013         Denoyer 2015         Li 2013         Wang 2015         Xia 2016         Xu 2014         Total (95% CI)         Heterogeneity: Tau <sup>2</sup> =         Test for overall effect         Study or Subgroup         Demirok 2013         Li 2013         Wann 2015	5.79 = 3.29, c t: Z = 4. <b>Solution</b> 11.11 7,06 9,57 6.3 7.39 = 0.68; c t: Z = 2.2 <b>Six</b> n <b>Mean</b> 11.1 7,06 9,57	2.30 df = 4 33 (P - 5MILE 5D 2.7 1.8 3.85 0.93 2.1 2.36 Chi <sup>2</sup> = 27 (P = 5D 7.7 3.85 0.93 2.7	261 (P = 0 < 0.000 Total 28 30 36 47 9 81 291 25.05, € 0.02) 291 25.05, € 0.02) 201 28 36 47	5.07 5.1);   <sup>2</sup> = FS- Mean 10.4 5.2 4.97 8.19 6.6 7.13 df = 5 Base Vean 9 8.58 9 8.58 9 8.58	2.14 <b>-LASIk SD</b> 2.5 1.8 3.57 1.45 1.6 2.56 (P = 0. <b>eline SD T</b> 1.2 57	97 257 Total 28 300 43 59 97 287 00001); 00001]; 000000]; 00001]; 00001]; 00000]; 00000]; 00000]; 00000]; 0000]	20.1% 100.0% Weight 13.3% 17.3% 10.2% 20.7% 19.6% 18.9% 100.0%   <sup>2</sup> = 80% N 20.0% N 20.0% 12.3% 20.1%	0.12 [-0.55, 0.79] 0.66 [0.36, 0.96] Mean Difference IV, Random, 95% CI 1.38 [0.87, 1.89 -0.30 [-0.94, 0.34 0.26 [-0.46, 0.98] 0.89 [0.12, 1.66] Mean Difference , Random, 95% CI 2.10 [1.01, 3.19] -1.52 [-3.41, 0.37] 0.30 [-0.82 0.27]	-10 -5 Favours [SMILE] Favours [FS-LASIK] Mean Difference IV, Random, 95% CI -10 -10 -5 Favours [SMILE] Favours [FS-LASIK] Mean Difference IV, Random, 95% CI
E _	All 2014 Total (95% CI) Heterogeneity: Chi <sup>2</sup> = Test for overall effect Study or Subgroup Demirok 2013 Denoyer 2015 Xia 2016 Xu 2014 Total (95% CI) Heterogeneity: Tau <sup>2</sup> = Test for overall effect Study or Subgroup Demirok 2013 Li 2013 Wang 2015 Xia 2016	5.79 = 3.29, c t: Z = 4. <u>Mean</u> 11.1 7.06 9.57 6.3 7.39 = 0.68; c t: Z = 2.: <u>Six n</u> <u>Mean</u> 11.1 7.06 9.57 6.3 7.39	2.30 ff = 4 33 (P - 5MILE 5D 2.7 1.8 3.85 0.93 2.1 2.36 Chi <sup>2</sup> = 27 (P = 5D 1 2.7 3.85 0.93 2.7 2.7 2.7 2.7 2.7 2.7 2.7 2.7	261           261           (P = 0           28           30           36           47           981           291           25.05,           602           704           28           36           47           691           25.05,           602           704           28           36           47           69	5.07 FS- 51); l <sup>2</sup> = FS- Mean 10.4 5.2 4.97 6.6 7.13 df = 5 Base Mean 9 8.58 4 9.87 1 6.6 8.58 4 9.87 1	$\frac{2.14}{SD}$ $\frac{-LASIK}{SD}$ $\frac{SD}{2.5}$ $\frac{1.45}{1.6}$ $\frac{1.45}{2.56}$ $(P = 0)$ $\frac{1.2}{.42}$ $\frac{.42}{.57}$ $\frac{.3}{3}$	97 257 <b>Total</b> 288 300 43 59 97 <b>287</b> 00001); <b>otal W</b> 28 38 47 69	$\begin{array}{c} \hline 20.1\% \\ \hline 100.0\% \\ \hline 13.3\% \\ 17.3\% \\ 10.2\% \\ 20.7\% \\ 19.6\% \\ 18.9\% \\ \hline 100.0\% \\  ^2 = 80\% \\ \hline \\ \hline \\ \hline \\ \hline \\ \hline \\ 20.0\% \\ 16.5\% \\ -21.8\% \\ -20.9\% \\ -20.9\% \\ \hline \end{array}$	0.12 [-0.55, 0.79] 0.66 [0.36, 0.96] Mean Difference IV, Random, 95% CI 0.30 [-0.34, 0.34] 0.30 [-0.94, 0.34] 0.26 [-0.46, 0.98] 0.39 [0.12, 1.66] Mean Difference (, Random, 95% CI 2.10 [1.01, 3.19] -1.52 [-3.41, 0.37] 0.30 [-0.82, 0.22] 0.50 [-1.6 0, 36]	-10 -5 Favours [SMILE] Favours [FS-LASIK] Mean Difference IV, Random, 95% CI -10 -5 Favours [SMILE] Favours [FS-LASIK] Mean Difference IV, Random, 95% CI
	XU 2014         Total (95% CI)         Heterogeneity: Chi <sup>2</sup> =         Test for overall effect         Study or Subgroup         Demirok 2013         Denoyer 2015         Li 2013         Wang 2015         Xu 2014         Total (95% CI)         Heterogeneity: Tau <sup>2</sup> =         Test for overall effect         Study or Subgroup         Demirok 2013         Li 2013         Wang 2015         Xia 2016         Xu 2014	$S_{1} = 3.29, c$ $S_{2} = 4.$ $S_{3} = 4.$ $S_{1} = 4.$	2.30 33 (P - 33 (P - 33 (P - 50 50 50 50 50 50 50 50 50 50	261 (P = 0 < 0.000 Total 28 30 36 47 69 81 291 225.05, € 0.02) 28 36 47 69 81 291 24 83 64 7 7 83 83 83 83 83 83 83 83 83 83 83 83 83	5.07 FS-5 Mean 10.4 5.2 4.97 8.19 6.6 7.13 df = 5 Base Vean 9 8.58 4 9.87 1 6.8	2.14 -LASIK SD 2.5 1.8 3.57 1.45 2.56 (P = 0) eline SD T 1.2 .42 .57 3 .28	97 257 Total 28 30 30 43 30 43 30 97 287 287 00001); 287 47 69 81	20.1% 100.0% Weight 13.3% 17.3% 10.2% 20.7% 18.9% 100.0% 1 <sup>2</sup> = 80% N Veight N 20.0% 16.5% 20.8% - 20.9% - 20.8% - 20.8%	0.12 [-0.55, 0.79] 0.66 [0.36, 0.96] Mean Difference IV, Random, 95% CI 2.09 [0.30, 3.88] 1.38 [0.87, 1.89] -0.30 [-0.94, 0.34] 0.26 [-0.46, 0.98] 0.89 [0.12, 1.66] Mean Difference f, Random, 95% CI 2.10 [1.01, 3.19] 1.52 [-3.41, 0.37] 0.30 [-0.82, 0.22] 0.50 [-1.36, 0.36] 0.56 [-3.42, 0.28]	-10 -5 Favours [SMILE] Favours [FS-LASIK] Mean Difference I, Random, 95% CI -10 -5 Favours [SMILE] Favours [FS-LASIK] Mean Difference IV, Random, 95% CI
	XII 2014         Total (95% CI)         Heterogeneity: Chi <sup>2</sup> =         Test for overall effect         Study or Subgroup         Demirok 2013         Denoyer 2015         Li 2013         Wang 2015         Xia 2016         Xu 2014         Total (95% CI)         Heterogeneity: Tau <sup>2</sup> =         Test for overall effect         Study or Subgroup         Demirok 2013         Li 2013         Wang 2015         Xia 2016         Xu 2014	s.79 s s.79 s s.29, c t z = 4. s t z = 4. 11.1 7 7.06 9.57 7.39 = 0.68; c t z = 2. Six n 11.1 7.06 6.3 7.39 9.57 6.3 7.39	2.30 df = 4 33 (P - 50 2.7 1.8 3.85 0.93 2.1 2.36 Chi <sup>2</sup> = 2 27 (P = 50 1 2.7 3.85 0.93 2.1 2.36 0.93 2.1 2.7 3.85 0.93 2.1 2.36	261 (P = 0 < 0.000 Total 28 30 36 47 69 81 25.05, € 0.02) 28 36 47 69 81 25.05, € 0.02)	S.57         FS-5           51); l <sup>2</sup> F           10.4         5.2           4.97         8.19           6.6         7.13           df = 5         Base           Mean         9           8.58         4           9.87         1           6.8         0.35	$\begin{array}{c} \textbf{-LASIk}\\ \textbf{SD}\\ \textbf{2.5}\\ \textbf{1.6}\\ \textbf{2.56}\\ \textbf{1.6}\\ \textbf{2.56}\\ \textbf{(P=0)}\\ \textbf{(P=0)}\\ \textbf{SD T}\\ \textbf{1.2}\\ \textbf{.42}\\ \textbf{.57}\\ \textbf{3}\\ \textbf{.28}\\ \end{array}$	<b>Total</b> 28 30 30 43 39 97 <b>287</b> 00001); 287 287 00001); 287 69 81	Weight           13.3%           17.3%           10.2%           20.7%           19.6%           18.9%           100.0%           I <sup>2</sup> = 80%           Veight IV           20.0%           16.5%           21.8%           20.9%           20.8%           20.8%	0.12 [-0.55, 0.79] 0.66 [0.36, 0.96] Mean Difference IV, Random, 95% CI 0.70 [-0.66, 2.06 1.80 [0.89, 2.71] 2.09 [0.30, 3.88 1.38 [0.87, 1.89 -0.30 [-0.94, 0.34 0.26 [-0.46, 0.98 0.89 [0.12, 1.66] Mean Difference , Random, 95% CI 2.10 [1.01, 3.19] 1.52 [-3.41, 0.37] 0.30 [-0.82, 0.22] 0.50 [-1.36, 0.36] .96 [-3.84, -2.08]	-10 -5 Favours [SMILE] Favours [FS-LASIK] Mean Difference IV, Random, 95% CI -10 -10 -5 Favours [SMILE] Favours [FS-LASIK] Mean Difference IV, Random, 95% CI
	Total (95% CI) Heterogeneity: Chi <sup>2</sup> = Test for overall effect Demirok 2013 Demoyer 2015 Li 2013 Wang 2015 Xia 2016 Xu 2014 Total (95% CI) Heterogeneity: Tau <sup>2</sup> = Test for overall effect Study or Subgroup Demirok 2013 Li 2013 Wang 2015 Xia 2016 Xu 2014 Total (95% CI)	s.79 s s.79 s s.79 s s.29, c Mean 11.11 7 7.06 6.3 7.39 = 0.68; c six n Mean 11.1 11.1 11.1 2 5.7 5.7 5.7 5.7 5.7 5.7 5.7 5.7 5.7 5.7	df = 4 4 33 (P - 5MILE SD 2.7 1.8 3.85 2.1 2.36 Chi <sup>2</sup> = 2 27 (P = 0.93 2.1 2.36	261 (P = 0 < 0.000 28 30 36 47 69 81 225.05, € 0.02) 28 36 47 69 81 21 28 36 69 81 1 28 36	S.57); I <sup>2</sup> = FS-5 Mean 10.4 5.2 4.97 6.6 7.13 df = 5 Base Mean 9 8.58 4 9 8.58 4 9 8.58 4 9 8.58 8.58 9 8.58 9 8.58 8.58 9 8.58 9 8.58 9 8.58 9 8.58 9 8.58 9 8.58 9 8.58 9 8.58 9 8.58 9 8.58 9 8.58 9 8.58 9 8.58 10 8.58 10 8.58 10 8.58 10 8.58 10 10 10 10 10 10 10 10 10 10	<b>-LASIK SD</b> 2.5         1.45         5.5         1.6         2.56         (P = 0)         eline         SD T         1.2         .37         3.28	257 257 28 30 30 30 43 59 97 287 287 0001); 0001]; 00001]; 00001]; 0001]; 0001]; 00001]; 0001]; 0001]; 000	Weight           13.3%           17.3%           10.2%           20.7%           19.6%           19.6%           10.2%           10.6%           20.7%           10.6%           10.6%           20.7%           10.6%           20.7%           20.7%           20.7%           20.7%           20.7%           20.7%           20.7%           20.7%           20.7%           20.7%           20.7%           20.7%           20.7%           20.8%           20.2%           20.2%           20.3%	0.12 [-0.55, 0.79] 0.66 [0.36, 0.96] Mean Difference IV, Random, 95% CI 0.30 [-0.94, 0.34] 0.26 [-0.46, 0.98] 0.89 [0.12, 1.66] Mean Difference (, Random, 95% CI 2.10 [1.01, 3.19] -1.52 [-3.41, 0.37] 0.30 [-0.82, 0.22] 0.50 [-1.36, 0.36] 2.96 [-3.84, -2.08] 0.62 [-2.10, 0.87]	Hean Difference I V, Random, 95% Cl Hean Difference V, Random, 95% Cl Mean Difference V, Random, 95% Cl Mean Difference V, Random, 95% Cl
	XU 2014         Total (95% CI)         Heterogeneity: Chi <sup>2</sup> =         Test for overall effect         Study or Subgroup         Demirok 2013         Denoyer 2015         Li 2013         Wang 2015         Xia 2016         Xu 2014         Total (95% CI)         Heterogeneity: Tau <sup>2</sup> =         Demirok 2013         Li 2013         Wang 2015         Xia 2016         Xu 2014         Total (95% CI)         Heterogeneity: Tau <sup>2</sup> =	s.79 s s.79 s s.29, c t : Z = 4. S Mean 11.1 7 7.06 9.57 6.3 7.39 = 0.68; c t : Z = 2. Six n Mean 11.1 7.06 9.57 6.3 7.39 - 2.55; c 2.55; c 2.	df = 4  df = 33 (P - 33) (P	261 (P = 0 < 0.000 Total 28 30 36 47 69 81 25.05, € 0.02) 28 81 291 25.05, € 0.02) 28 81 291 25.05, € 0.02) 28 81 291 291 201 83 81 201 201 201 201 201 201 201 201 201 20	$\begin{array}{c} \text{FS-} \\ \text{S-} \\ \text{FS-} \\ \text{Mean} \\ 10.4 \\ \text{S-} \\ S-$	$\frac{SD}{2.5}$ $\frac{1.45}{1.6}$ $\frac{SD}{2.56}$ $\frac{1.6}{2.56}$ $\frac{1.6}{2.56}$ $\frac{1.2}{.42}$ $\frac{.42}{.57}$ $\frac{.28}{.28}$ $< 0.00$	257 <b>Total</b> 28 300 43 59 97 <b>287</b> (0001); <b>287</b> (0001); 69 81 263 11 (0001); 69 81 263 11 (0001); 69 81 263 11 (0001); 7 28 28 28 28 28 28 28 28 28 28	Weight           100.0%           Weight           13.3%           10.2%           20.7%           10.2%           20.7%           18.9%           100.0%           100.0%           118.9%           100.0%           100.0%           20.3% <td< td=""><td>0.12 [-0.55, 0.79] 0.66 [0.36, 0.96] IV, Random, 95% CI 0.70 [-0.66, 2.06 1.80 [0.89, 2.71] 2.09 [0.30, 3.88] 1.38 [0.87, 1.89] -0.30 [-0.94, 0.34] 0.26 [-0.46, 0.98] 0.89 [0.12, 1.66] Mean Difference (, Random, 95% CI 2.10 [1.01, 3.19] -1.52 [-3.41, 0.37] 0.30 [-0.82, 0.22] 0.50 [-1.36, 0.36] .96 [-3.84, -2.08] 0.62 [-2.10, 0.87]</td><td>Hean Difference IV, Random, 95% CI Favours [SMILE] Favours [FS-LASIK] Mean Difference IV, Random, 95% CI Mean Difference IV, Random, 95% CI Mean Difference</td></td<>	0.12 [-0.55, 0.79] 0.66 [0.36, 0.96] IV, Random, 95% CI 0.70 [-0.66, 2.06 1.80 [0.89, 2.71] 2.09 [0.30, 3.88] 1.38 [0.87, 1.89] -0.30 [-0.94, 0.34] 0.26 [-0.46, 0.98] 0.89 [0.12, 1.66] Mean Difference (, Random, 95% CI 2.10 [1.01, 3.19] -1.52 [-3.41, 0.37] 0.30 [-0.82, 0.22] 0.50 [-1.36, 0.36] .96 [-3.84, -2.08] 0.62 [-2.10, 0.87]	Hean Difference IV, Random, 95% CI Favours [SMILE] Favours [FS-LASIK] Mean Difference IV, Random, 95% CI Mean Difference IV, Random, 95% CI Mean Difference
	XU 2014         Total (95% CI)         Heterogeneity: Chi <sup>2</sup> =         Test for overall effect         Study or Subgroup         Demirok 2013         Denoyer 2015         Li 2013         Wang 2015         Xia 2016         Xu 2014         Total (95% CI)         Heterogeneity: Tau <sup>2</sup> =         Demirok 2013         Li 2013         Wang 2015         Xia 2016         Xu 2014         Total (95% CI)         Heterogeneity: Tau <sup>2</sup> =         Test for overall effect:	s.79 s s.79 s s.79 s s.79 s s.79 s s.70 s s.	$\begin{aligned} &\text{df} = 4 \\ &\text{33} (P \\ &\text{smille} \\ &\text$	261 (P = 0 < 0.000 Total 28 30 36 47 29 81 291 25.05, € 0.02) 7 28 30 36 47 291 291 291 291 291 291 291 291	$\begin{array}{c} \textbf{FS-}\\ \textbf{Mean}\\ 10.4\\ \textbf{S.2}\\ \textbf{4.97}\\ \textbf{6.6}\\ \textbf{7.13}\\ \textbf{df}=\textbf{5}\\ \textbf{8.58} \\ \textbf{4}\\ \textbf{9.87} \\ \textbf{1}\\ \textbf{6.8}\\ \textbf{8.58} \\ \textbf{9.87} \\ \textbf{1}\\ \textbf{6.8}\\ \textbf{0.35} \\ \textbf{3}\\ \textbf{f}=\textbf{4} (\textbf{P}) \end{array}$	<pre>2.14 = 0% SD 2.5 1.8 3.57 1.45 1.6 2.56 (P = 0 eline SD T 1.2 .28 &lt; 0.00</pre>	97 257 Total 28 30 43 59 97 287 2001); 69 81 263 11 0001); F	Weight           100.0%           Weight           13.3%           17.3%           10.2%           20.7%           19.6%           18.9%           100.0%           /*eight           100.0%           18.9%           20.7%           20.7%           20.7%           20.7%           20.7%           20.7%           20.7%           20.7%           20.7%           20.7%           20.7%           20.8%           20.8%           20.8%           20.8%           20.8%           20.8%           20.8%           20.8%           20.8%           20.8%           20.8%           20.8%           20.9%	0.12 [-0.55, 0.79] 0.66 [0.36, 0.96] IV, Random, 95% CI 2.09 [0.30, 3.88] 1.38 [0.87, 1.89] -0.30 [-0.94, 0.34] 0.26 [-0.46, 0.98] 0.89 [0.12, 1.66] Mean Difference 4. Random, 95% CI 2.10 [1.01, 3.19] 1.52 [-3.41, 0.37] 0.30 [-0.82, 0.22] 0.50 [-1.36, 0.36] .96 [-3.84, -2.08] 0.62 [-2.10, 0.87]	Hean Difference IV, Random, 95% CI Favours (SMILE) Favours (FS-LASIK) Mean Difference IV, Random, 95% CI Mean Difference IV, Random, 95% CI Favours (FS-LASIK) Mean Difference IV, Random, 95% CI Favours (FS-LASIK) Mean Difference IV, Random, 95% CI Favours (Six months) Favours (Baseline)
	XU 2014         Total (95% CI)         Heterogeneity: Chi <sup>2</sup> Test for overall effect         Study or Subgroup         Demirok 2013         Denoyer 2015         Li 2013         Wang 2015         Xia 2016         Xu 2014         Total (95% CI)         Heterogeneity: Tau <sup>2</sup> =         Test for overall effect         Study or Subgroup         Demirok 2013         Li 2013         Wang 2015         Xia 2016         Xu 2014         Total (95% CI)         Heterogeneity: Tau <sup>2</sup> =         Test for overall effect:	s.79 s s.79 s mean 11.1 7 c 6.3 7.39 = 0.68; (t t: Z = 2. Six n Mean 11.1 1.1 7 c 6.3 7.39 = 0.68; (t t: Z = 2. Six n 2.55; Cl Z = 0.8	df = 4 4 $df = 33 (P - 33) (P - 33)$	261 (P = 0.) (P = 0.	$\begin{array}{c} \textbf{FS-1}\\ \textbf{FS-1}\\ \textbf{FS-1}\\ \textbf{Mean}\\ \textbf{10.4}\\ \textbf{5.2}\\ \textbf{4.97}\\ \textbf{6.6}\\ \textbf{7.13}\\ \textbf{df} = 5 \\ \textbf{8.58} \\ \textbf{4}\\ \textbf{9.87} \\ \textbf{1}\\ \textbf{6.8}\\ \textbf{8.58} \\ \textbf{9.87} \\ \textbf{1}\\ \textbf{6.8}\\ \textbf{0.35} \\ \textbf{3}\\ \textbf{f} = 4 \left( \textbf{P} \right) \\ \textbf{f} = 4 \left$	<pre>2.14 = 0% SD 2.5 1.8 3.57 1.45 1.6 2.56 (P = 0 Pline SD T 1.2 .42 .57 3 .28 &lt; 0.00</pre>	97 257 Total 28 30 30 43 30 43 30 97 287 287 287 69 97 287 69 38 47 69 38 81 263 10 287 287 287 287 287 287 287 287	Weight           100.0%           Weight           13.3%           17.3%           10.2%           20.7%           19.6%           100.0%           100.0%           Veight           10.2%           10.2%           10.2%           10.2%           10.2%           10.2%           10.2%           10.2%           10.2%           10.2%           10.2%           10.2%           10.2%           10.2%           10.2%           10.2%           11.1%           20.3%           20.3%           20.3%           20.3%           20.3%           20.3%           20.3%           20.3%           20.3%	0.12 [-0.55, 0.79] 0.66 [0.36, 0.96] Mean Difference IV, Random, 95% CI 1.80 [0.89, 2.71] 2.09 [0.30, 3.88] 1.38 [0.87, 1.89] -0.30 [-0.94, 0.34] 0.26 [-0.46, 0.98] 0.89 [0.12, 1.66] Mean Difference (, Random, 95% CI 2.10 [1.01, 3.19] 1.52 [-3.41, 0.37] 0.30 [-0.82, 0.22] 0.50 [-1.36, 0.36] 2.96 [-3.84, -2.08] 0.62 [-2.10, 0.87]	Hean Difference IV, Random, 95% CI Hean Difference IV, Random, 95% CI Mean Difference
	XU 2014         Total (95% CI)         Heterogeneity: Chi <sup>2</sup> Test for overall effect         Study or Subgroup         Demirok 2013         Denoyre 2015         Li 2013         Wang 2015         Xia 2016         Xu 2014         Total (95% CI)         Heterogeneity: Tau <sup>2</sup> =         Test for overall effect         Study or Subgroup         Demirok 2013         Li 2013         Wang 2015         Xia 2016         Xu 2014         Total (95% CI)         Heterogeneity: Tau <sup>2</sup> =         Test for overall effect:         Study or Subbarour	s.79 s s.79 s s.79 s s s mean 11.1 7 7.06 3.7.39 s s it Z = 4. S mean 11.1 7 7.06 3.7.39 s s s it Z = 4. s mean 11.1 1.1 7 7.06 3.7.39 s s s s s s s s s s s s s	$\begin{aligned} & \text{if } = 4 \\ & \text{if } = 33 \text{ (P} - 333 \text{ (P} - 3333 \text{ (P} - 33333 \text{ (P} - 3333 \text{ (P} - 33333 \text{ (P} - 33333 \text{ (P} - 3333 \text{ (P} - 33333 \text{ (P} - 333333 \text{ (P} - 33333333 \text{ (P} - 3333333333333333 \text{ (P} - 3333333333 \text{ (P} - 3333333333333$	261 (P = 0.) (P = 0.	$\begin{array}{l} \text{S.S.}\\ \text{FS-}\\ \text{Mean}\\ 10.4\\ \text{S.2}\\ 4.97\\ 8.19\\ 6.6\\ 7.13\\ \text{df} = 5\\ 9\\ 8.58\\ 4\\ 9\\ 9.87\\ 1\\ 6.8\\ 8.58\\ 4\\ \text{s.}8\\ 1\\ 6.8\\ \text{s.}8\\ 4\\ \text{c.}8\\ 1\\ 6.8\\ \text{s.}8\\ 4\\ \text{c.}8\\ 1\\ 6.8\\ \text{c.}8\\ 1\\ 6.8\\ 1\\ 6.8\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\$	-LASIK SD 2.5 1.8 3.57 1.45 2.56 (P = 0 (P = 0) (P = 0	97 257 Total 28 30 30 43 30 43 30 97 287 287 287 69 97 0001); f 69 81 263 147 69 38 47 69 38 47 69 30 001; f 69 147 147 147 147 147 147 147 147	Weight           100.0%           Weight           13.3%           17.3%           10.2%           20.7%           19.6%           100.0%           100.0%           12           20.7%           20.7%           18.9%           100.0%           121.8%           20.3%           20.4%           20.4%           20.4%           20.4%           20.4%           20.4%           20.4%           20.4%           20.4%           20.4%           20.	0.12 [-0.55, 0.79] 0.66 [0.36, 0.96] Mean Difference IV, Random, 95% CI 0.70 [-0.66, 2.06 1.80 [0.89, 2.71] 2.09 [0.30, 3.88] -0.30 [-0.94, 0.34 0.26 [-0.46, 0.98] 0.89 [0.12, 1.66] Mean Difference (Random, 95% CI 2.10 [1.01, 3.19] -1.52 [-3.41, 0.37] 0.30 [-0.82, 0.22] 0.50 [-1.36, 0.36] 2.96 [-3.84, -2.08] 0.62 [-2.10, 0.87] 	Hean Difference IV, Random, 95% CI Mean Difference IV, Random, 95% CI Mean Difference IV, Random, 95% CI Mean Difference IV, Random, 95% CI Mean Difference IV, Random, 95% CI
	XI 2014         Total (95% CI)         Heterogeneity: Chi <sup>2</sup> =         Test for overall effect         Study or Subgroup         Demirok 2013         Denoyer 2015         Li 2013         Wang 2015         Xia 2016         Xu 2014         Total (95% CI)         Heterogeneity: Tau <sup>2</sup> =         Test for overall effect         Study or Subgroup         Demirok 2013         Li 2013         Wang 2015         Xia 2016         Xu 2014         Total (95% CI)         Heterogeneity: Tau <sup>2</sup> =         Test for overall effect:         Study or Subgroup         Demirok 2013         Xu 2014         Total (95% CI)         Heterogeneity: Tau <sup>2</sup> =         Test for overall effect:         Study or Subgroup         Demirok 2013	5.79 5.79 5.79 5.79 5.7 6.3 7.39 5.7 7.39 7.39 7.	$\begin{aligned} & \text{SMILE} \\ & \text{SMILE} \\ & \text{SMILE} \\ & \text{SD} \\ & 2.7 \\ & 2.36 \\ & 2.1 \\ & 2.36 \\ & 2.7 \\ & 2.7 \\ & 2.7 \\ & 2.7 \\ & 2.7 \\ & 2.7 \\ & 2.7 \\ & 2.7 \\ & 2.1 \\ & 2.7 \\ & 2.1 \\ & 2.7 \\ & 2.1 \\ & 2.7 \\ & 2.1 \\ & 2.2 \\ & 2.5 \\$	261 261 28 30 36 47 69 81 291 291 291 28 36 47 69 81 1 291 28 36 69 81 1 28 3.23, d 0.022 1 28 3.23, d 0.022 1 28 3.23, d 28 3.23, d 28 28 3.23, d 28 3.23, d 28 3.23, d 28 3.23, d 28 3.23, d 28 3.23, d 28 3.23, d 28 3.23, d 3.23,	$\begin{array}{l} \text{FS-}\\ \text{Mean}\\ 10.4\\ 5.2\\ 4.97\\ 8.19\\ 6.6\\ 7.13\\ \text{df} = 5\\ 9\\ 8.58\\ 4.97\\ 8.58\\ 4.97\\ 1.3\\ \text{s}, 58\\ 1.3\\ 1.3\\ 1.3\\ 1.3\\ 1.3\\ 1.3\\ 1.3\\ 1.3$	$\frac{-\text{LASIkk}}{\text{SD}}$ $\frac{-\text{LASIkk}}{2.5}$ $\frac{1.45}{1.6}$ $\frac{2.56}{2.56}$ $\frac{(P = 0)}{2.56}$	97 257 Total 28 30 30 30 30 30 30 30 30 30 30	Weight           100.0%           13.3%           17.3%           10.2%           20.7%           19.6%           10.2%           20.7%           18.9%           100.0%           12           20.0%           16.5%           1.8.9%           20.0%           16.5%           20.8%           20.8%           20.8%           22.8%           20.8%           22.8%           22.8%           22.8%           22.8%           22.8%           22.8%           22.8%           22.8%           23.8%           24.8%           25.8%           26.8%           27.8%           28.9%           29.9%           100.0%           21.8%           22.8%           24.9%           25.9%           26.6%	0.12 [-0.55, 0.79] 0.66 [0.36, 0.96] Mean Difference IV, Random, 95% CI 0.70 [-0.66, 2.06] 1.80 [0.89, 2.71] 2.09 [0.30, 3.88] -0.30 [-0.94, 0.34] 0.26 [-0.46, 0.98] 0.89 [0.12, 1.66] Mean Difference (Random, 95% CI 2.10 [1.01, 3.19] -1.52 [-3.41, 0.37] 0.30 [-0.82, 0.22] 0.50 [-1.34, -2.08] 0.62 [-2.10, 0.87] -2.10 [0.01, 3.19] -3.20 [-3.44, -2.08] 0.62 [-2.10, 0.87] -2.10 [0.01, 0.84] -2.10 [0.01, 0.84] -2.10 [0.01, 0.84] -3.20 [-3.84, -2.08] 0.62 [-2.10, 0.87] -2.10 [0.01, 0.84] -2.10 [0.01,	-10 -5 Favours [SMILE] Favours [FS-LASIK] Mean Difference IV, Random, 95% CI Mean Difference IV, Random, 95% CI
	XU 2014         Total (95% CI)         Heterogeneity: Chi <sup>2</sup> =         Test for overall effect         Study or Subgroup         Demirok 2013         Denoyer 2015         Li 2013         Wang 2015         Xia 2016         Xu 2014         Total (95% CI)         Heterogeneity: Tau <sup>2</sup> =         Test for overall effect         Study or Subgroup         Demirok 2013         Li 2013         Xia 2016         Xia 2015         Xia 2014         Total (95% CI)         Heterogeneity: Tau <sup>2</sup> =         Test for overall effect:         Study or Subgroup         Demirok 2013         Li 2013         Using Subgroup         Demirok 2013         Li 2013	5.79 5.79 5.79 5.79 5.70 6.3 7.39 5.73 5.74 5.74 5.74 5.74 5.74 5.74 5.74 5.74 5.75 5	$\begin{aligned} &\text{smill} \\ &\text$	261 261 28 30 36 47 69 81 291 28 30 36 47 69 81 25.05, 6 0.02) 28 36 47 69 81 21 25.05, 6 0.000 28 36 47 69 81 21 28 36 47 7 69 81 25.05, 60 28 36 47 7 69 81 25.05, 60 28 36 47 7 69 81 25.05, 60 28 36 47 7 69 81 28 36 47 7 69 81 28 36 47 7 81 28 36 47 7 81 28 36 47 7 81 28 36 47 7 81 28 36 47 7 81 28 36 47 7 81 28 36 47 7 81 28 36 47 7 81 28 36 81 28 36 47 7 81 28 36 47 7 81 28 36 47 7 81 28 36 81 28 36 47 7 81 28 36 81 28 36 81 28 36 81 28 36 81 28 36 81 28 36 83 83 83 20 81 28 30 28 30 20 20 28 30 28 30 20 20 20 20 20 20 20 20 20 2	$\begin{array}{c} \text{FS}, \\ \text{S}, \\ \text{FS}, \\ \text{Mean} \\ 10.4 \\ \text{S}, \\ 10.4 \\ 10.4 \\ 10.4 \\ 10.4 \\ 10.4 \\ 10.4 \\ 10.4 \\ 10.4 \\ 10.4 \\ 10.4 \\ 10.4 \\ 10.4 \\ 10.4 \\ 10.4 \\ 10.4 \\ 10.4 \\ 10.4 \\ 10.4 \\ 10$	$\begin{array}{c} \text{-LASIk}\\ \text{sD}\\ 2.5\\ 1.8\\ 3.57\\ 1.45\\ 2.56\\ 2.56\\ (P=0.\\ 1.2\\ .42\\ .57\\ 3\\ .28\\ < 0.00\\ \hline \text{sD T}\\ 1\\ .57\\ \end{array}$	97         257           C         Total           28         30           30         30           43         39           97         287           287         69           81         26           263         10           2001); i         1           0001); i         1           otal         W           28         33	Weight           100.0%           Weight           13.3%           17.3%           10.2%           20.7%           10.2%           20.7%           18.9%           100.0%           18.8%           100.0%           12.1%           20.3%           20.9%           20.9%           20.9%           20.0%           20.9%           20.0%           20.2%           N           Veight N           20.9%           2           92%           Veight N           20.6%           20.6%           20.6%           100.0%	0.12 [-0.55, 0.79] 0.66 [0.36, 0.96] Mean Difference IV, Random, 95% CI 2.09 [0.30, 3.88] 1.38 [0.87, 1.89] -0.30 [-0.94, 0.34] 0.26 [-0.46, 0.98] 0.89 [0.12, 1.66] Mean Difference (, Random, 95% CI 2.10 [1.01, 3.19] -1.52 [-3.41, 0.37] 0.30 [-0.82, 0.22] 0.50 [-1.36, 0.36] 9.96 [-3.84, -2.08] 0.62 [-2.10, 0.87] 	Hean Difference IV, Random, 95% CI I Favours [SMILE] Favours [FS-LASIK] Mean Difference IV, Random, 95% CI I Favours [SMILE] Favours [FS-LASIK] Mean Difference IV, Random, 95% CI I Favours [Six months] Favours [Baseline] Mean Difference IV, Random, 95% CI
	XU 2014         Total (95% CI)         Heterogeneity: Chi <sup>2</sup> Test for overall effect         Study or Subgroup         Demirok 2013         Denyer 2015         Li 2013         Wang 2015         Xia 2016         Xu 2014         Total (95% CI)         Heterogeneity: Tau <sup>2</sup> =         Test for overall effect         Study or Subgroup         Demirok 2013         Li 2013         Wang 2015         Xia 2016         Xu 2014         Total (95% CI)         Heterogeneity: Tau <sup>2</sup> =         Test for overall effect:         Study or Subgroup         Demirok 2013         Li 2013         Wang 2015         Study or Subgroup         Demirok 2013         Li 2013         Wang 2015	5.79 5 5.79 5 5.79 5 5.70 6 5.70 7 5.73 9 5.73 9 5.75 7 5.73 9 5.75 7 5.73 9 5.75 7 5.73 9 5.75 7 5.73 9 5.77 9	$\begin{aligned} & \text{SMILE} \\ &$	261 261 28 30 36 47 69 81 291 291 291 291 291 291 291 29	$\begin{array}{c} \text{S.S7} \\ \text{FS-} \\ \text{Mean} \\ 10.4 \\ \text{S.2} \\ 4.97 \\ \text{S.8} \\ 4.97 \\ \text{S.8} \\ \text{S.8} \\ \text{A.97} \\ \text{S.8} \\ \text{S.8} \\ \text{A.97} \\ \text{S.8} \\ \text{S.8} \\ \text{S.8} \\ \text{A.9} \\ \text{S.8} \\ \text{S.8} \\ \text{A.9} \\ \text{S.8} \\ \text{S.8} \\ \text{S.8} \\ \text{A.9} \\ \text{S.8} \\ \text{S.8} \\ \text{S.8} \\ \text{A.9} \\ \text{S.8} $	$\begin{array}{l} \textbf{2.14} \\ \textbf{SD} \\ \textbf{2.5} \\ \textbf{1.8} \\ \textbf{3.57} \\ \textbf{1.45} \\ \textbf{2.56} \\ \textbf{(P = 0)} \\ \textbf{2.56} \\ \textbf{(P = 0)} \\ \textbf{3.57} \\ \textbf{3.57}$	97 257 Total 28 30 30 97 287 287 00001); 7 287 287 287 287 287 287 287	Weight           100.0%           Weight           13.3%           13.3%           13.3%           13.3%           10.2%           20.7%           19.6%           100.0%           4'eight           20.8%           20.8%           20.8%           20.8%           20.8%           20.8%           20.8%           20.8%           20.8%           21.8%           20.6%           15.9%           15.9%           15.9%           21.6%	0.12 [-0.55, 0.79] 0.66 [0.36, 0.96] Mean Difference IV, Random, 95% CI 1.38 [0.87, 1.89] -0.30 [-0.94, 0.34 0.26 [-0.46, 0.98] 0.89 [0.12, 1.66] Mean Difference (Random, 95% CI 2.10 [1.01, 3.19] -1.52 [-3.41, 0.37] 0.30 [-1.36, 0.36] 2.96 [-3.84, -2.08] 0.62 [-2.10, 0.87] Complete Complete Co	-10 -5 Favours [SMILE] Favours [FS-LASIK] Mean Difference IV, Random, 95% CI -10 -10 -5 Favours [SMILE] Favours [FS-LASIK] Mean Difference IV, Random, 95% CI -5 Favours [Six months] Favours [Baseline] Mean Difference IV, Random, 95% CI -5 Favours [Six months] Favours [Baseline] Mean Difference IV, Random, 95% CI
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- - -	XU 2014 Total (95% CI) Heterogeneity: Chi <sup>2</sup> = Test for overall effect Study or Subgroup Demirok 2013 Denoyer 2015 Li 2013 Wang 2015 Xia 2016 Xu 2014 Total (95% CI) Heterogeneity: Tau <sup>2</sup> = Test for overall effect Study or Subgroup Demirok 2013 Li 2013 Wang 2015 Xia 2016 Xu 2014 Total (95% CI) Heterogeneity: Tau <sup>2</sup> = Test for overall effect: Study or Subgroup Demirok 2013 Li 2013 Wang 2015 Xia 2016 Xia 2016 Xia 2016 Xia 2016 Xia 2016	5.79 5.79 5.79 5.79 5.70	$\begin{array}{l} \text{ff} = 4 \\ 33 \ (\text{P} \cdot \text{f}) \\ \text{SMILE} \\ \hline \text{SMILE} \\ 18 \\ 3.85 \\ 2.7 \ (\text{P} = 1 \\ 2.36 \\ \text{Chi}^2 = 27 \\ 2.7 \\ 2.7 \\ 2.7 \\ 2.7 \\ 2.7 \\ 2.1 \\ 2.36 \\ \text{hi}^2 = 5 \\ 1.1 \\ 2.36 \\ \text{hi}^2 = 5 \\ 1.1 \\ 2.5 \\ 1.45 \\ 1.2 \\ 2.56 \\ \end{array}$	261 261 28 300 36 47 69 81 291 25.05, € 0.02) 7 28 30 47 69 81 291 291 291 291 201 201 201 201 201 201 201 20	$\begin{array}{c} \text{FS}, \\ \text{Mean} \\ \text{II}, \\ \text{II}, \\ \text{II}, \\ \text{II}, \\ \text{III}, \\ \text{III}, \\ \text{III}, \\ \text{IIII}, \\ \text{IIII}, \\ \text{IIII}, \\ \text{IIIII}, \\ \text{IIIII}, \\ \text{IIIII}, \\ \text{IIIII}, \\ \text{IIIIII}, \\ \text{IIIIII}, \\ \text{IIIIII}, \\ \text{IIIIII}, \\ \text{IIIIIII}, \\ \text{IIIIIII}, \\ \text{IIIIIII}, \\ \text{IIIIIIIIII}, \\ IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII$	$\frac{-\text{LASIK}}{\text{SD}}$ $\frac{-\text{LASIK}}{2.5}$ $\frac{1.6}{2.56}$ $(P = 0.0)$ $\frac{1.2}{2.5}$ $\frac{1.2}{.57}$ $\frac{1.2}{.57}$ $\frac{1.2}{.57}$ $\frac{1.5}{.57}$	97 257 Total 28 30 30 30 43 59 97 287 287 287 47 69 81 263 14 47 69 81 263 14 47 69 81 263 14 47 69 81 265 14 28 38 81 265 28 38 28 38 28 38 28 38 28 38 28 38 28 38 28 38 28 38 28 38 28 38 28 38 28 38 28 38 28 38 28 38 28 38 28 38 26 38 28 38 26 38 26 38 26 38 26 38 26 26 27 28 38 26 38 26 38 26 38 26 38 26 38 26 38 26 38 26 38 26 38 26 38 26 38 26 38 26 38 26 38 26 38 26 38 26 38 26 38 38 26 37 29 97 97 97 97 97 97 97 97 97 9	Weight           100.0%           Weight           13.3%           17.3%           10.2%           20.7%           19.6%           100.0%           Veight I           20.0%           16.5%           20.8%           20.8%           20.8%           20.8%           20.8%           20.8%           21.5%           20.6%           15.9%           21.6%           20.8%           20.6%           15.9%           20.6%           15.9%           20.8%           20.8%           20.8%           20.8%           20.8%           20.8%           20.8%           20.8%           20.8%           20.8%           20.8%           20.16%	0.12 [-0.55, 0.79] 0.66 [0.36, 0.96] Mean Difference IV, Random, 95% CI 2.09 [0.30, 3.88] 1.38 [0.87, 1.89] -0.30 [-0.94, 0.34] 0.26 [-0.46, 0.98] 0.89 [0.12, 1.66] Mean Difference (, Random, 95% CI 2.10 [1.01, 3.19] 1.52 [-3.41, 0.37] 0.50 [-1.36, 0.36] 2.96 [-3.84, -2.08] 0.62 [-2.10, 0.87] 	Hean Difference IV, Random, 95% Cl Mean Difference
	XII 2014         Total (95% CI)         Heterogeneity: Chi <sup>2</sup> =         Test for overall effect         Study or Subgroup         Demirok 2013         Denoyer 2015         Li 2013         Wang 2015         Xia 2016         Xu 2014         Total (95% CI)         Heterogeneity: Tau <sup>2</sup> =         Test for overall effect         Study or Subgroup         Demirok 2013         Li 2013         Wang 2015         Xia 2016         Xu 2014         Total (95% CI)         Heterogeneity: Tau <sup>2</sup> =         Test for overall effect:         Study or Subgroup         Demirok 2013         Xu 2014         Demirok 2013         Li 2013         Wang 2015         Xia 2016         Xu 2013         Wang 2015         Xia 2016         Xu 2014	5.79 5 5.79 5 5.79 6 5.70 6 5.70 7 5.73 9 5.73 9 5.74 9 5.75 7 6.3 7.39 9 5.75 7 6.3 7.39 9 5.77 6 5.73 9 5.77 6 5.73 9 5.77 6 5.73 9 5.77 6 5.73 9 5.77 6 5.73 9 5.77 6 5.73 9 5.77 6 5.77 7 5.77	$\begin{aligned} & f = 4 \\ 33 (P - K \\ SMILE \\ SMILE \\ SMILE \\ SMILE \\ SMILE \\ 2.7 \\ 3.85 \\ 2.7 \\ 3.85 \\ 2.7 \\ 3.85 \\ 2.7 \\ 3.85 \\ 2.7 \\ 3.85 \\ 1.6 \\ 2.5 \\ 1.6 \\ 2.56 \end{aligned}$	261 261 (P = 0. 28 30 36 47 69 81 291 25.05, 0.02) 7 28 36 47 69 81 291 28 36 47 69 81 291 28 36 47 69 81 291 28 36 47 69 81 291 28 36 47 69 81 291 28 36 47 69 81 291 28 36 47 69 81 291 28 36 47 69 81 291 28 36 47 69 81 291 261 27 47 69 81 291 261 47 69 81 291 261 47 69 81 291 261 47 69 81 291 261 47 69 81 291 261 47 69 81 291 261 47 69 81 201 261 47 69 81 201 261 47 69 81 201 261 47 69 81 261 47 69 81 261 47 69 81 261 47 69 81 261 47 69 81 261 67 47 69 81 261 67 47 69 81 261 47 69 81 261 47 69 81 261 47 69 81 261 47 69 81 261 67 47 69 81 261 67 47 69 91 261 67 47 69 91 261 57 57 57 57 57 57 57 57 57 57	$\begin{array}{c} \text{FS-}\\ \text{Mean}\\ 10.4\\ \text{FS-}\\ 4.97\\ 8.19\\ 6.6\\ 7.13\\ \text{df} = 5\\ \textbf{G}\\ \text{c}\\ \textbf{G}\\ $	-LASIk SD 2.5 1.8 3.57 1.45 1.6 2.56 (P = 0 (P = 0) (P = 0)	97 257 Total 28 30 30 0 43 59 97 287 0001); 0 287 0001); 0 287 287 0001); 0 287 287 0001); 0 287 287 0001); 0 0 0 0 0 0 0 0 0 0 0 0 0	Weight           100.0%           Weight           13.3%           13.3%           13.3%           10.2%           20.7%           19.6%           100.0%           18.9%           100.0%           12.8%           20.8%           21.8%           20.8%           21.8%           20.8%           21.8%           20.8%           21.8%           20.6%           15.9%           21.1%           21.1%           21.1%           21.1%	0.12 [-0.55, 0.79] 0.66 [0.36, 0.96] Mean Difference IV, Random, 95% CI 1.38 [0.87, 1.89] -0.30 [-0.94, 0.34 0.26 [-0.46, 0.98] 0.89 [0.12, 1.66] Mean Difference (kandom, 95% CI 2.10 [1.01, 3.19] -1.52 [-3.41, 0.37] 0.30 [-0.82, 0.22] 0.50 [-1.36, 0.36] .96 [-3.84, -2.08] 0.62 [-2.10, 0.87] -37 [-1.56, -0.78] 1.30 [0.30, 2.30] .91 [-5.20, -0.78] 1.27 [-1.40, -0.78] 1.27 [-1.40, -0.78] 1.27 [-1.40, -0.78] 1.27 [-1.40, -0.78] 1.29 [-2.14, -0.26] .96 [-4.77, -3.15]	Hean Difference IV, Random, 95% CI Mean Difference IV, Random, 95% CI
	XII 2014         Total (95% CI)         Heterogeneity: Chi <sup>2</sup> =         Test for overall effect         Study or Subgroup         Demirok 2013         Denoyre 2015         Li 2013         Wang 2015         Xia 2016         Xu 2014         Total (95% CI)         Heterogeneity: Tau <sup>2</sup> =         Test for overall effect         Study or Subgroup         Demirok 2013         Li 2013         Wang 2015         Xia 2016         Xu 2014         Total (95% CI)         Heterogeneity: Tau <sup>2</sup> =         Test for overall effect:         Study or Subgroup         Demirok 2013         Li 2013         Wang 2015         Xia 2016         Xu 2014         Total (95% CI)         Demirok 2013         Li 2013         Wang 2015         Xia 2016         Xu 2014         Total (95% CI)         Total (95% CI)	5.79 5.79 5.79 5.79 5.79 5.70 5.70 6.39 7.39 5.73	$\begin{aligned} & \text{ff} = 4 \\ & 33 \text{ (P} \\ & \text{smille} \\ & 2.7 \\ & 2.7 \\ & 2.3 \\ & \text{smille} \\ & 2.3 \\ & \text{smille} \\ & smil$	Zof1           261           28           30           36           47           69           81           28           36           47           69           81           28           36           47           69           81           28           36           47           69           31           28           36           47           69           31           28           36           47           69           31           28           36           47           97           28           30           43           30           43           30           43           30           43           30           43           30           43           30           43	$\begin{array}{c} \text{FS}, \\ \text{FS}, \\ \text{Mean} \\ 10.4 \\ 5.2 \\ 4.97 \\ 8.19 \\ 6.6 \\ 7.13 \\ \text{df} = 5 \\ 0.35 \\ 3 \\ 8.58 \\ 4.98 \\ 1 \\ 9.87 \\ 1 \\ 6.8 \\ 9.87 \\ 1 \\ 6.8 \\ 9.87 \\ 1 \\ 6.8 \\ 9.87 \\ 1 \\ 7.8 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ $	ELASIK       = 0%       SD       2.5       1.45       1.6       2.55       1.6       2.56       SD       SD       SD       1.2       .42       .57       3       .28       < 0.00	97 257 Total 28 30 0 0 0 0 0 0 0 0 0 0 0 0 0	Veight           13.3%           17.3%           20.7%           10.2%           20.7%           10.2%           20.7%           10.2%           20.7%           10.2%           20.7%           10.2%           20.7%           10.2%           10.2%           10.6%           10           10.5%           20.9%           20.9%           20.9%           20.8%           21.1%           21.1%           21.1%           21.1%	0.12 [-0.55, 0.79] 0.66 [0.36, 0.96] IV, Random, 95% CI 0.70 [-0.66, 2.06 1.80 [0.89, 2.71] 2.09 [0.30, 3.88 1.38 [0.87, 1.89] -0.30 [-0.94, 0.34] 0.26 [-0.46, 0.98 0.89 [0.12, 1.66] 4ean Difference (, Random, 95% CI 2.10 [1.01, 3.19] -0.30 [-0.82, 0.22] 0.50 [-1.36, 0.36] 9.56 [-3.44, -2.08] 0.62 [-2.10, 0.87] 	Hean Difference IV, Random, 95% CI Favours (SMILE) Favours (FS-LASIK) Mean Difference IV, Random, 95% CI Mean Difference IV, Random, 95% CI Mean Difference IV, Random, 95% CI Mean Difference IV, Random, 95% CI
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	XU 2014         Total (95% CI)         Heterogeneity: Chi <sup>2</sup> =         Test for overall effect         Study or Subgroup         Demirok 2013         Denoyer 2015         Li 2013         Wang 2015         Xia 2016         Xu 2014         Total (95% CI)         Heterogeneity: Tau <sup>2</sup> =         Test for overall effect         Study or Subgroup         Demirok 2013         Li 2013         Wang 2015         Xia 2016         Xu 2014         Total (95% CI)         Heterogeneity: Tau <sup>2</sup> =         Test for overall effect:         Study or Subgroup         Demirok 2013         Li 2013         Wang 2015         Xia 2016         Xu 2014         Total (95% CI)         Heterogeneity: Tau <sup>2</sup> =         Test for overall effect:         Total (95% CI)         Heterogeneity: Tau <sup>2</sup> =         Test for overall effect:	5.79 5 5.79 5 5.79 5 5.79 5 5.70 5	$\begin{aligned} & f = 4 \\ 33 (P \cdot Smill E \\ Smill E \\ 2.7 \\ 1.8 \\ 3.85 \\ 2.1 \\ 2.36 \\ 2.7 \\ 3.85 \\ 2.7 \\ 2.7 \\ 3.85 \\ 2.7 \\ 3.85 \\ 2.7 \\ 3.85 \\ 1.6 \\ 2.56 \\ 1.45 \\ 1.6 \\ 2.56 \\ 1.6 \\ 0 (P = 1) \end{aligned}$	261 261 (P = 0.000 28 30 36 47 69 251 251 28 36 47 69 81 291 251 28 36 47 69 81 291 28 36 47 69 81 291 28 36 47 69 81 291 28 36 47 769 81 291 28 36 47 769 81 291 28 36 47 769 81 291 28 36 47 769 81 291 28 36 47 769 81 291 28 36 47 769 81 291 28 36 47 769 81 291 28 36 47 769 81 291 28 36 47 769 81 291 26 57 77 97 81 27 28 36 47 769 81 291 26 57 77 97 1 28 36 47 77 97 1 28 30 47 77 97 1 28 30 47 77 97 1 28 30 47 77 97 1 28 30 47 77 97 1 28 30 47 77 97 1 28 30 47 77 97 1 28 30 47 77 97 1 28 30 47 77 97 1 27 77 97 1 27 77 97 1 27 77 97 1 27 77 77 97 1 27 77 77 97 1 27 77 77 97 1 27 77 97 1 25 77 37 37 37 77 97 1 25 77 37 77 97 1 25 77 25 77 37 77 77 77 77 77 77 77 77	$\begin{array}{l} \text{FS-}\\ \text{Mean}\\ 10.4\\ 5.2\\ 4.97\\ 8.19\\ 6.6\\ 7.13\\ \text{df} = 5\\ \textbf{df} = $	-LASIK SD 2.5 1.45 1.45 1.6 2.56 (P = 0) eline SD T 1.2 .42 .42 .57 .33 .28 < 0.00 eline SD T 1.57 .33 .35 3.33 .15 < 0.00	97         257           Total         28           30         30           359         97           287         287           0001);         7           283         38           47         69           81         47           69         81           10001);         F           otal         W           283         33           59         97           263         14           97         260           10001);         F	$\begin{array}{c} \hline 20.1\% \\ \hline 20.1\% \\ \hline 100.0\% \\ \hline 13.3\% \\ \hline 13.3\% \\ \hline 17.3\% \\ 19.6\% \\ \hline 10.2\% \\ 19.6\% \\ \hline 10.0\% \\ \hline $	0.12 [-0.55, 0.79] 0.66 [0.36, 0.96] Mean Difference IV, Random, 95% CI 1.38 [0.87, 1.89 -0.30 [-0.94, 0.34 0.26 [-0.46, 0.98] 0.89 [0.12, 1.66] Mean Difference (Random, 95% CI 2.10 [1.01, 3.19] 1.52 [-3.41, 0.37] 0.30 [-0.82, 0.22] 0.50 [-1.36, 0.36] .96 [-3.84, -2.08] 0.62 [-2.10, 0.87] .130 [0.30, 2.30] .91 [-5.20, -0.62] 1.37 [-1.96, -0.78] 1.27 [-2.44, -0.26] .96 [-4.77, -3.15] 1.58 [-3.29, 0.14]	Hean Difference IV, Random, 95% CI Mean Difference IV, Random, 95% CI Favours [Six months] Favours [Baseline] Mean Difference IV, Random, 95% CI Favours [Six months] Favours [Baseline]

Fig 2. Forest plot showing the mean difference (MD) of tear breakup time (TBUT) comparing small incision lenticule extraction (SMILE) with femtosecond laser-assisted laser in situ keratomileusis (FS-LASIK) (A) preoperatively and in postoperative visits at (B) one week, (C) one month, (D) three months and (E) six months. Forest plot showing the MD of TBUT in the (F) SMILE and (G) FS-LASIK groups at six months postoperatively compared with preoperatively. Cl = confidence interval; SD = standard deviation.

	Six months ve v	ersus Baseline ( <i>p</i> alue)			SMILE versus FS-LA	ASIK ( <i>p</i> value)	
	The SMILE group	The FS-LASIK group	Baseline	One week post- surgery	One month post- surgery	Three months post- surgery	Six months post- surgery
TBUT	0.42	0.07	0.50	0.51	<sup>†</sup> 0.04	<sup>†</sup> < 0.0001	<sup>†</sup> 0.02
SIT	<sup>†</sup> 0.02	<sup>†</sup> < 0.00001	0.42	0.20	0.57	0.19	0.62
OSDI	0.79	<sup>†</sup> < 0.00001	0.53	_	<sup>†</sup> < 0.00001	<sup>†</sup> < 0.00001	<sup>†</sup> 0.006
TFO	-	-	-	-	0.41	-	0.46

#### Table 4. Results of the examination of the forest plots (p value).

TBUT, tear breakup time; SIT, Schirmer's I test; OSDI, ocular surface disease index; TFO, tear film osmolarity.  $^{+}p < 0.05$ .

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Previous meta-analyses suggested that SMILE shows obvious superiority over FS-LASIK by exhibiting a lower risk of postoperative dry eye [3–5]. However, a different conclusion has been drawn in our study.

In terms of tear film quality, although the SMILE group had a longer TBUT at one month, three months, and six months postoperatively than the FS-LASIK group, there were no statistically significant changes in TBUT and TFO values at six months postoperatively compared with preoperatively in either group. In terms of fluid quantity, SIT values were significantly decreased at the six-month postoperative visit in both SMILE and FS-LASIK groups. There was no significant difference between these two groups at any time point. Denoyer et al.'s provided the postoperative values at six months but could not provide preoperative values [6], so the number of studies included in the comparison for FS-LASIK versus SMILE at six months postoperatively and the comparisons for postoperative six months versus preoperative values in both FS-LASIK and SMILE groups are different, which explains the different results in these comparisons. In general, both SMILE and FS-LASIK achieved acceptable tear film quality and similarly decreased tear fluid quantity at six months postoperatively. The SMILE group does not have obvious competitive superiority in objective parameters over the FS-LASIK group.

Subjective symptoms are also important in the diagnosis of dry eye. The various studies used different questionnaires to compare subjective symptoms. There was no significant difference between the SMILE and FS-LASIK groups in either the McMonnies score [15] or the Salisbury eye evaluation questionnaire [16] at the end of follow-up. The OSDI questions were drawn from three subscales: ocular symptoms, vision-related functions, and environmental triggers [14]. In our analysis, significant differences in OSDI scores between the SMILE and FS-LASIK groups existed at all time points. Moreover, OSDI scores in the SMILE group returned to preoperative levels at six months, but significant increases in the postoperative scores were still found in the FS-LASIK group at that same point in time. It thus appears that people in the SMILE groups enjoyed significantly better vision-targeted, health-related quality of life. Considering the two studies [14,17] that reported OSDI scores employed cohorts without blinding methods, psychological factors may have influenced the accuracy of and confidence in the results, meaning that some people could have preferred SMILE because it was a new and ostensibly better approach.

Like dry eye, corneal sensation reduction is fairly common after refractive surgery. The included RCT suggested that there was no association between corneal sensation and dry eye parameters [12], but other studies have suggested that decreased corneal sensation does play a role in postoperative dry eye [2,6,23–25]; one possible explanation is that corneal nerves can be cut during flap creation in LASIK, and subsequent excimer ablation further severs stromal

				50 10	tai we	ynt	IV, IIACU, 33/0 CI	IV, FIXED, 95% CI
Demirok 2013	17.5 6.	5 28	18.5	5.5	28 13	3.7%	-1.00 [-4.15, 2.15]	
Li 2013	14.63 7.5	1 38	15.36	9.47	33 8	3.4%	-0.73 [-4.75, 3.29]	
Xu 2014	17.49 7.4	8 81	18.55	7.75	97 27	7.0%	-1.06 [-3.30, 1.18]	
Total (05% CI)		216		-	17 100	09/	0.49 [ 1.65 0.69]	
Heterogeneity: $Chi^2 =$ Test for overall effect	0.71, df = 3 Z = 0.81 (P	(P = 0.8) = 0.42)	87); I <sup>2</sup> = 0	2 )%	17 100	.0%	-0.48 [-1.65, 0.68]	-10 -5 0 5 10 Favours [SMILE] Favours [FS-LASIK]
		_						
Study or Subgroup	SMIL Mean S	E D Tota	FS- I Mean	SD T	otal We	ight	Mean Difference IV, Random, 95% CI	Mean Difference IV, Random, 95% Cl
Demirok 2013	17.3 4	.8 28	3 17.9	3.6	28 3	6.1%	-0.60 [-2.82, 1.62]	
Xia 2016	9.1 3	.9 69	9 5.6	3.5	32 2 59 4	2.5% 1.3%	3.51 [-1.04, 8.06] 3.50 [2.22, 4.78]	
Total (95% CI)		134	1		110 10	0.0%	2 02 [-1 05 5 09]	
Heterogeneity: Tau <sup>2</sup> = Test for overall effect:	= 5.51; Chi <sup>2</sup> = : Z = 1.29 (P	= 10.00, = 0.20)	df = 2 (P	= 0.007	); $I^2 = 80$	)%	2.02 [ 1.03, 5.03]	-10 -5 0 5 10 Favours [SMILE] Favours [FS-LASIK]
Study or Subgrou-	SMILE Moor CD	Total	FS-L		al 14/at-	ht	Mean Difference	Mean Difference
Demirok 2013	15.8 5.9	28	17.5	5.1 2	28 20.	2%	-1.70 [-4.59, 1.19]	
Denoyer 2015	13.2 6.1	30	19.9 1	0.5	30 14.	9% -	-6.70 [-11.05, -2.35]	
Li 2013 Xia 2016	9.7 6 1	37	10.9 7 7.6	.99 3 3.8 9	31 17. 59 24	0% 5%	1.21 [-2.52, 4.94]	
Xu 2014	16.98 6.43	81	17.35 7	.72	23.	3%	-0.37 [-2.45, 1.71]	
Total (95% CI)		245		24	15 100.	0%	-0.71 [-3.17, 1.75]	
Heterogeneity: Tau <sup>2</sup> = Test for overall effect:	5.64; Chi <sup>2</sup> = Z = 0.56 (P	16.52, ( = 0.57)	df = 4 (P	= 0.002)	; $I^2 = 76$	%		-10 -5 0 5 10 Favours [SMILE] Favours [FS-LASIK]
	SMILI		FS-I	ASIK			Mean Difference	Mean Difference
Study or Subgroup	Mean SI	) Total	Mean	SD To	tal Wei	ght	IV, Fixed, 95% CI	IV, Fixed, 95% Cl
Demirok 2013	16.6	4 28	16.5	4.4	28 31	1.5%	0.10 [-2.10, 2.30]	
Xia 2016	12.6 5.	5 69	10.4	5.5	59 41	.8%	2.20 [0.29, 4.11]	
Xu 2014	17.46 9.2	5 81	18.22	9.82	97 19	.4%	-0.76 [-3.57, 2.05]	
Total (95% CI)		214		2	14 100	.0%	0.83 [-0.40, 2.07]	•
Heterogeneity: Chi <sup>2</sup> =	3.66, df = 3	(P = 0.3	$30); I^2 = 1$	.8%				-10 -5 0 5 10
Test for overall effect	: Z = 1.32 (P	= 0.19)						Favours [SMILE] Favours [FS-LASIK]
Chudu on Cubanoun	SMIL	E Total	FS-		stal Wa	inhe	Mean Difference	Mean Difference
Demirok 2013	17.3 4.	4 28	16.9	3.9	28 1	6.4%	0.40 [-1.78, 2.58]	
Denoyer 2015	17.3 8.	2 30	16.9	7.8	30	4.7%	0.40 [-3.65, 4.45]	
Li 2013	13.28 8.7	2 36	13.17	9.32	30	4.0%	0.11 [-4.28, 4.50]	
Xu 2014	9.5 4.	1 69 3 81	9.3	7.2	59 5 97 1	6.4% 8.5%	0.13 [-1.92, 2.18]	
Total (05% CI)		244			244 10	0.0%	0.22 [ 0.66 1.11]	
Heterogeneity: Chi <sup>2</sup> =	0.04. df = 4	P = 1.0	$(00):  ^2 = 0$	0%	244 10	0.0%	0.23 [-0.00, 1.11]	
Test for overall effect	: Z = 0.50 (P	= 0.62)						-10 -5 0 5 10 Favours [SMILE] Favours [FS-LASIK]
	Six montl	15	Basel	ine		N	lean Difference	Mean Difference
Study or Subgroup	Mean SD	Total	Mean S	D Tota	Weigh	t	IV, Fixed, 95% CI	IV, Fixed, 95% Cl
Li 2013	13.28 8.72	36	14.63 7.	51 38	3 15.2 3 9.3	% .	-1.35 [-5.07, 2.37]	
Xia 2016	9.5 4.1	69	11.8 5	.5 69	48.9	% -: ×	2.30 [-3.92, -0.68]	
Au 2014	17.13 6.73	81	17.49 7.4	+0 8	L 26.7	70 .	-0.30 [-2.55, 1.83]	
<b>Total (95% CI)</b> Heterogeneity: $Chi^2 =$ Test for overall effect:	2.71, df = 3 Z = 2.38 (P =	<b>214</b> P = 0.44 0.02)	); I <sup>2</sup> = 0%	216	5 100.09	% -1	38 [-2.51, -0.24] _+ _]	10 -5 0 5 10 Favours [Six months] Favours [Baseline]
Study or Subaroup	Six montl Mean SD	is Total	Basel Mean 9	ine D Tota	Weigh	t N	Nean Difference IV. Fixed, 95% CI	Mean Difference IV. Fixed, 95% CI
Demirok 2013	16.9 3.9	28	18.5 5	.5 28	3 14.2	% ·	-1.60 [-4.10, 0.90]	
Li 2013 Xia 2016	13.17 9.32	30	15.36 9.4	47 33	3 4.1	% ·	-2.19 [-6.83, 2.45]	
Xu 2014	17 7.2	97	18.55 7.3	75 97	7 19.9	~~ ~~ %	-1.55 [-3.66, 0.56]	
Total (95% CI)		214		21-	7 100.00	% -7	17 [-3 11 -1 23]	•
Heterogeneity: Chi <sup>2</sup> =	0.83, df = 3	P = 0.84	); I <sup>2</sup> = 0%	217	100.03	-3 -2	, [-3.11, =1.23] +	
Test for overall effect:	Z = 4.52 (P <	0.0000	1)				-1	Favours [Six months] Favours [Baseline]
		_						
	Li 2013 Xia 2016 Xia 2014 Total (95% CI) Heterogeneity: Chi <sup>2</sup> = Test for overall effect Demirok 2013 Li 2013 Xia 2016 Total (95% CI) Heterogeneity: Tau <sup>2</sup> = Test for overall effect Study or Subgroup Demoyer 2015 Li 2013 Xia 2016 Xu 2014 Total (95% CI) Heterogeneity: Tau <sup>2</sup> = Test for overall effect: Study or Subgroup Demirok 2013 Li 2013 Xia 2016 Xu 2014 Total (95% CI) Heterogeneity: Chi <sup>2</sup> = Test for overall effect: Study or Subgroup Demirok 2013 Li 2013 Xia 2016 Xu 2014 Total (95% CI) Heterogeneity: Chi <sup>2</sup> = Test for overall effect: Study or Subgroup Demirok 2013 Li 2013 Xia 2016 Xu 2014 Total (95% CI) Heterogeneity: Chi <sup>2</sup> = Test for overall effect: Study or Subgroup Demirok 2013 Li 2013 Xia 2016 Xu 2014 Total (95% CI) Heterogeneity: Chi <sup>2</sup> = Test for overall effect: Study or Subgroup Demirok 2013 Li 2013 Xu 2014 Total (95% CI) Heterogeneity: Chi <sup>2</sup> = Test for overall effect:	Li 2013 14.63 7.5: Xia 2016 11.8 5.1: Xia 2014 17.49 7.41 Total (95% CI) Heterogeneity: Chi <sup>2</sup> = 0.71, df = 3 Test for overall effect: Z = 0.81 (P Study or Subgroup Mean SD Demirok 2013 13.51 10.5 Xia 2016 9.1 3 Total (95% CI) Heterogeneity: Tau <sup>2</sup> = 5.51; Chi <sup>2</sup> = Test for overall effect: Z = 1.29 (P Study or Subgroup Mean SD Demirok 2013 15.8 5.9 Demoyer 2015 13.2 6.1 Li 2013 12.11 7.58 Xia 2016 9.7 6.1 Xia 2016 9.7 6.4 Xia 2016 9.7 6.4 Xia 2016 16.98 6.43 Total (95% CI) Heterogeneity: Tau <sup>2</sup> = 5.64; Chi <sup>2</sup> = Test for overall effect: Z = 0.56 (P - SMULL Study or Subgroup Mean SD Demirok 2013 16.6 4 Li 2013 14.14 9.33 Xia 2016 12.6 5.1 Xia 2016 9.5 4. Xia 2016 9.3 9. Test for overall effect: Z = 2.38 (P = Study or Subgroup Mean 5D Demirok 2013 13.77 9.32 Xia 2016 9.3 9. Xia 2017 7.2 Xia 2016 9.3 9. Xia 2018 7. Xia 2016 9.3 9. Xia 2014 7.7 7.2 Xia	Li 2013 Li 2013 Li 2013 Li 2014 Li 2014 Li 2014 Li 2014 Li 2014 Li 2014 Li 2014 Li 2014 Li 2013 Li 2016 Li 2013 Li 2013 Li 2013 Li 2016 Li 2013 Li 2013 Li 2016 Li 2017 Li 2013 Li 2013 Li 2013 Li 2013 Li 2013 Li 2013 Li 2015 Li 2013 Li 2015 Li 2013 Li 2015 Li 2013 Li 2015 Li 2013 Li 2015 Li 2013 Li 2015 Li 2013 Li 2016 Li 2015 Li 2016 Li 2015 Li 2016 Li 2015 Li 2016 Li 2016 Li 2017 Li 2018 Li 2016 Li 2018 Li 2016 Li 2018 Li 2013 Li 2016 Li 2014 Li 2013 Li 2016 Li 2014 Li 2013 Li 2013 Li 2016 Li 2013 Li 2013 Li 2013 Li 2016 Li 2014 Li 2013 Li 2013 Li 2013 Li 2013 Li 2013 Li 2013 Li 2014 Li 2013 Li 2014 Li 2014 Li 2014 Li 2013 Li 2014 Li 2014 Li 2014 Li 2014 Li 2014 Li 2014 Li 2013 Li 2014 Li 2015 Li 2015 Li 2014 Li 2015 Li 2015 Li 2015 Li 2014 Li 2015 Li 2014 Li 2015 Li	Li 2013       14.63       7.51       38       15.36       37         Xia 2016       11.8       5.5       69       11.8       5.5       7         Xu 2014       17.49       7.48       81       18.55       7         Total (95% CI)       216       18.5       7       7       7.8       81       18.55       7         Study or Subgroup       Mean       SD       Total (Mean       50       Total (Mean       7       10         Via 2013       13.51       10.96       37       10       7       10         Xia 2016       9.1       3.9       69       5.6       7       7       10         Total (95% CI)       123       14       16.08       37       10       19.9       7         Heterogeneity: Tau <sup>2</sup> = 5.51; Chi <sup>2</sup> = 10.00, df = 2 (P       7.6       7       10       19.9       7         Va 2014       16.98       6.43       81       17.35       7       7         Va 2014       16.98       6.43       81       17.35       7       7         Va 2014       16.98       6.43       81       13.73       7       82       16.5       10.9       7.6	Li 2013 14.63 7.51 38 15.36 9.47 Xia 2016 11.8 5.5 69 11.8 3.9 Xu 2014 17.49 7.48 81 18.55 7.75 Total (95% CI) 216 2 Heterogeneity: Chi <sup>2</sup> = 0.71, df = 3 ( $P = 0.87$ ); l <sup>2</sup> = 0% Test for overall effect: Z = 0.81 ( $P = 0.42$ ) Test for overall effect: Z = 0.81 ( $P = 0.42$ ) Test for overall effect: Z = 0.81 ( $P = 0.42$ ) Total (95% CI) 13.4 8 28 17.9 3.6 Li 2013 13.51 10.96 37 10 8.28 Xia 2016 9.1 3.9 69 5.6 3.5 Total (95% CI) 134 Heterogeneity: Tau <sup>2</sup> = 5.51; Chi <sup>2</sup> = 10.00, df = 2 ( $P = 0.007$ Test for overall effect: Z = 1.29 ( $P = 0.20$ ) SMILE FS-LASIK Study or Subgroup Mean SD Total Mean SD Tot Demirok 2013 15.8 5.9 28 17.5 5.1 5 Li 2013 12.11 7.58 37 10.9 7.9 3 Xia 2016 9.7 6.1 69 7.6 3.8 1 Li 2013 12.11 7.58 37 10.9 7.9 3 Xia 2016 9.7 6.1 69 7.6 3.8 1 Li 2013 12.11 7.58 37 10.9 7.9 3 Xia 2016 9.7 6.1 69 7.6 3.8 1 Li 2013 12.11 7.58 37 10.9 7.9 3 Xia 2016 12.6 5.5 69 10.4 5.5 Xu 2014 16.98 6.43 81 17.33 7.72 5 Total (95% CI) 245 24 Heterogeneity: Tau <sup>2</sup> = 5.64; Chi <sup>2</sup> = 16.52, df = 4 ( $P = 0.002$ ) Test for overall effect: Z = 0.56 ( $P = 0.57$ ) Study or Subgroup Mean SD Total Mean SD Tot Demirok 2013 16.6 4 28 16.5 4.4 Li 2013 14.14 9.38 36 13.73 9.54 Xia 2016 12.6 5.5 69 10.4 5.5 Xu 2014 17.46 9.25 81 18.22 9.82 Total (95% CI) 214 28 Li 2013 16.9 7.8 Li 20.30; l <sup>2</sup> = 18% Test for overall effect: Z = 1.32 ( $P = 0.30$ ; l <sup>2</sup> = 18% Test for overall effect: Z = 0.50 ( $P = 0.62$ ) Study or Subgroup Mean SD Total Me	Li 2013 14.63 7.51 38 15.36 9.47 33 4 Kia 2016 11.8 5.5 69 11.8 3.9 55 57 Xu 2014 17.49 7.48 81 18.55 7.75 97 27 Total (95% CI) 216 217 100 Heterogeneity: Chi <sup>2</sup> = 0.71, df = 3 (P = 0.87); l <sup>2</sup> = 0% Test for overall effect: Z = 0.81 (P = 0.42) SILE FS-LASIK Sudy or Subgroup Mean SD Total Mean SD Total Weigh Demirok 2013 17.3 4.8 28 17.9 3.8 28 2 Xia 2016 9.1 3.9 69 5.6 3.5 59 4 Total (95% CI) 134 119 10 Heterogeneity: Tau <sup>2</sup> = 5.51; Chi <sup>2</sup> = 10.00, df = 2 (P = 0.007); l <sup>2</sup> = 80 Test for overall effect: Z = 1.29 (P = 0.20) SILE FS-LASIK Sudy or Subgroup Mean SD Total Mean SD Total Weigh Demover 2013 15.8 5.9 28 17.5 5.1 28 20 Demover 2015 13.2 6.1 30 19.9 10.5 3.0 44 Li 2013 12.11 7.58 37 10.9 7.99 31 17. Xia 2016 9.7 6.1 69 7.6 3 .8 59 24 Va 2014 16.98 6.43 81 17.3 7.72 97 23. Total (95% CI) 245 245 1000 Heterogeneity: Tau <sup>2</sup> = 5.64; Chi <sup>2</sup> = 16.52, df = 4 (P = 0.002); l <sup>2</sup> = 76 Test for overall effect: Z = 0.56 (P = 0.57) SULG SUBGROUP Mean SD Total Mean SD Total Weigh Demirok 2013 16.6 4 28 16.5 4.4 28 30 Li 2013 16.7 4.4 28 16.7 3.9 2.8 10 7 Xia 2016 12.6 5.5 61 10.4 5.5 59 44 Xiu 2014 17.46 9.25 81 18.72 9.82 97 13 Total (95% CI) 214 214 214 100 Heterogeneity: Chi <sup>2</sup> = 3.66, df = 3 (P = 0.30); l <sup>2</sup> = 18% Test for overall effect: Z = 1.32 (P = 0.10); l <sup>2</sup> = 18% Test for overall effect: Z = 1.32 (P = 0.10); l <sup>2</sup> = 18% Test for overall effect: Z = 0.50 (P = 0.62) SILE SILE SILE SILE SILE SULGY SUBGROUP Mean SD Total Mean SD Total Weigh Demirok 2013 17.3 4.4 28 16.9 3.9 28 1 Xia 2016 9.5 4.1 69 9.9 2.6 59 5 Xia 2016 9.5 4.1 69 9.13.6 5.5 69 459 Xia 2016 9.5 4.1 69 9.13.6 5.5 69 459 Xia 2016 9.5 4.1 69 13.6 43 7.51 38 1 Total (95% CI) 214 24 24 100 Heterogeneity: Chi <sup>2</sup> = 0.04, df = 4 (P = 1.00); l <sup>2</sup> = 0% Test for overall effect: Z = 2.38 (P = 0.02) Six monts Baseline Study or Subgroup Mean SD Total Mean SD Total Weigh Demirok 2013 17.3 4.4 28 16.5 5.5 9 48 1.2 5.7 Total (95% CI) 214 24 100 Heterogeneity: Chi <sup>2</sup> = 0.33, df = 3 (P = 0.44); l <sup>2</sup> = 0% Test for overa	Li 2013 14.63 7.51 38 15.36 9.47 33 8.4% Xia 2016 11.8 5.5 69 11.8 3.9 55 5.9% Xu 2014 17.49 7.48 81 18.55 7.75 97 27.0% Total (95% C) 216 217 100.0% Heterogeneity: Chi <sup>2</sup> = 0.71, df = 3 (P = 0.87); l <sup>2</sup> = 0.% Test for overall effect: Z = 0.81 (P = 0.42) Study or Subgroup Mean 5D Total Mean 7D 3.6 28 36.1% Xia 2016 9.1 3.9 69 5.6 3.5 59 41.3% Total (95% C) 134 119 100.0% Heterogeneity: Tau <sup>2</sup> = 5.51; Chi <sup>2</sup> = 10.00, df = 2 (P = 0.007); l <sup>2</sup> = 80% Test for overall effect: Z = 1.29 (P = 0.20) Study or Subgroup Mean 5D Total Mean 5D Total Weight Demirok 2013 15.8 5.9 2.8 117.5 5.1 28 20.2% Xia 2016 9.1 3.9 69 5.6 3.5 59 41.3% Total (95% C) 134 134 119 100.0% Heterogeneity: Tau <sup>2</sup> = 5.51; Chi <sup>2</sup> = 10.00, df = 2 (P = 0.007); l <sup>2</sup> = 80% Test for overall effect: Z = 1.29 (P = 0.20) Study or Subgroup Mean 5D Total Mean 5D Total Weight Demirok 2013 15.8 5.9 2.8 117.5 5.7 297 23.3% Total (95% C) 245 245 100.0% Heterogeneity: Tau <sup>2</sup> = 5.64; Chi <sup>2</sup> = 16.52, df = 4 (P = 0.002); l <sup>2</sup> = 76% Test for overall effect: Z = 0.56 (P = 0.57) Study or Subgroup Mean 5D Total Mean 5D Total Weight Demirok 2013 16.6 4 28 16.7 39.54 30 7.3% Xia 2016 12.6 5.5 69 10.4 5.5 59 41.8% Yu 2014 17.46 9.25 81 18.72 9.62 97 19.4% Total (95% C) 214 214 214 100.0% Heterogeneity: Chi <sup>2</sup> = 3.66, df = 3 (P = 0.30); l <sup>2</sup> = 18% Test for overall effect: Z = 1.32 (P = 0.19) Study or Subgroup Mean 5D Total Mean 5D Total Weight Demirok 2013 17.3 4.4 28 16.9 3.9 2.8 16.4% Xia 2016 12.6 5.7 69 10.4 5.5 59 41.8% Yu 2014 17.13 6.73 81 17 7.2 97 18.5% Total (95% C) 214 21.4 214 100.0% Heterogeneity: Chi <sup>2</sup> = 0.60, df = 3 (P = 0.30); l <sup>2</sup> = 18% Test for overall effect: Z = 0.50 (P = 0.62) Six months Baseline Mean 5D Total Mean 5D Total Weight Demirok 2013 17.3 4.4 28 17.5 6.5 28 15.2% 7 Xia 2016 9.5 4.1 69 1.18 5.5 69 44.9% Xia 2016 9.5 4.1 69 1.18 5.5 69 44.9% Xia 2016 9.5 2.41 69 7.8 30 4.7% Xia 2016 9.5 2.41 69 7.8 30 4.7% Xia 2016 9.5 2.71 6.9 7.9 30 4.7% Xia 2016 9.3 2.6 59 11.8 3.9 59 61.8% 7 Xia 2016 9.3 2.6 79 11	Li 2013 1.463 7.51 3.8 15.36 9.47 33 8.4% $-7.31 - 4.75$ 1.29 Xa 2014 17.49 7.48 81 18.55 7.75 97 27.0% $-1.061 - 4.5$ 1.64 1.64 Xa 2014 17.49 7.48 81 18.55 7.75 97 27.0% $-1.061 - 4.5$ 1.64 1.64 Meterogenety: Ch <sup>2</sup> = 0.71, df = 3 0 = 0.87; lf = 0.8 Test for overall effect: $Z = 0.81$ ( $P = 0.42$ ) Total Weight IV, Random, 95% CI 20 mirok 2013 17.3 4.8 2.8 17.9 3.6 28 35.1 8 $-0.601 - 2.82$ , 1.62 Xa 2016 9.1 3.5 1 10.6 37 10 8.62 8 32 2.25 × 3.51 (-1.04, 8.66 Xa 2016 9.1 3.5 1 10.6 37 10 8.62 8 32 2.25 × 3.51 (-1.04, 8.66 Xa 2016 9.1 3.5 1 10.6 37 10 8.62 8 32 2.25 × 3.51 (-1.04, 8.66 Xa 2016 9.1 3.5 1 10.6 37 10 8.62 8 32 2.25 × 3.51 (-1.04, 8.66 Xa 2016 9.1 3.5 1 10.6 37 10 8.62 8 32 2.25 × 3.51 (-1.04, 8.66 Xa 2016 9.1 3.5 1 5.9 28 17.5 5.1 2.8 20.27 (-1.04, 8.66 Xa 2016 9.1 3.5 1 5.9 28 17.5 5.1 2.8 20.27 (-1.04, 8.66 Xa 2016 9.1 3.5 1 5.9 2.8 17.5 5.1 2.8 20.27 (-1.04, 8.66 Xa 2016 9.1 3.5 1 5.9 2.8 17.5 5.1 2.8 20.27 (-1.04, 8.66 Xa 2016 9.1 3.5 1 5.9 2.8 17.5 5.1 2.8 20.27 (-1.04, 8.66 Xa 2016 9.1 3.5 1 5.9 2.8 17.5 5.1 2.8 20.27 (-1.04, 5.06 1) 1.21 7.8 3 10.0 7.9 3 11 7.5 7.2 97 2.33 (-0.37 (-2.45, 1.71) 1.21 7.5 1.21 7.5 1.2 1.8 3 17.5 5.1 2.8 20.27 (-1.02, 5.30 1) 1.21 7.7 8 3 7 10.9 7.9 31 1.7 5 7.7 2 97 2.33 (-0.37 (-2.45, 1.71) 1.21 7.5 1.21 (1.56 X 1.5 5.9 1.6 1.5 7.7 2 97 2.33 (-0.37 (-2.45, 1.71) 1.21 7.5 1.21 (1.56 X 1.5 5.9 1.6 1.5 5.9 1.6 1.5 5.9 1.24 5 1.00 (-0.7.2) (-2.5 1.71) 1.21 7.5 1.21 (-1.04 1.25 2.5 4.94 1.20 1.25 2.5 4.94 1.20 1.20 1.21 7.74 9.25 81 11.22 9.82 7 71 9.4 (-2.76 (-3.57, 2.05) 1.21 7.3 4.2 2.5 6 9 1.04 5.5 5 9 1.04 (-0.06 (-0.21 1.2.5 2.4 1.1 3.20 1.1 (-1.46 9.25 6 1 10.4 5.5 5 9 1.4 (-1.62 0.04 1.1 (-2.5 2.5 0.4 1.1 3.20 1.1 (-2.5 0.5 0) 1.24 (-2.5 0.5 0) 1.24 (-2.5 0.5 0) 1.24 (-2.5 0.5 0) 1.24 (-2.5 0.5 0) 1.24 (-2.5 0.5 0) 1.24 (-2.5 0.5 0) 1.24 (-2.5 0.5 0) 1.24 (-2.5 0.5 0) 1.24 (-2.5 0.5 0) 1.24 (-2.5 0.5 0) 1.24 (-2.5 0.5 0) 1.24 (-2.5 0.5 0) 1.24 (-2.5 0.5 0) 1.24 (-2.5 0.5 0) 1.24 (-2.5 0.5 0) 1.24 (-2.5 0.5 0) 1.24 (-2.5 0.5 0) 1.24 (-2.5 0.5 0) 1.24 (-2.5 0

incision lenticule extraction (SMILE) with femtosecond laser-assisted laser in situ keratomileusis (FS-LASIK) (A) preoperatively and in postoperative visits at (B) one week, (C) one month, (D) three months and (E) six months. Forest plot showing the MD of SIT in the (F) SMILE and (G) FS-LASIK groups at six months postoperatively compared with preoperatively. Cl = confidence interval; SD = standard deviation.

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Fig 4. Forest plot showing the mean difference (MD) in ocular surface disease index (OSDI) comparing small incision lenticule extraction (SMILE) with femtosecond laser-assisted laser in situ keratomileusis (FS-LASIK) (A) preoperatively and in postoperative visits at (B) one month, (C) three months and (D) six months. Forest plot showing the MD of OSDI in the (E) SMILE and (F) FS-LASIK groups at six months postoperatively compared with preoperatively. CI = confidence interval; SD = standard deviation.



Fig 5. Forest plot showing the mean difference (MD) in tear film osmolarity (TFO) comparing small incision lenticule extraction (SMILE) with femtosecond laser-assisted laser in situ keratomileusis (FS-LASIK) at (A) one month and (B) six months postoperatively. Cl = confidence interval; SD = standard deviation.

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nerve fiber bundles, leading to decreased corneal sensation and increased dry eye symptoms [26]. The SMILE procedure, by contrast, uses a small side cut instead of creating a flap and achieves refractive change by lenticule creation with a femtosecond laser instead of by photoablation with an excimer laser. One meta-analysis reported that corneal sensitivity in the SMILE group recovered faster than in the FS-LASIK group during the first three months post-operatively, but that recovery was similar six months after surgery [13].

Our results should be interpreted with caution, because the study has a relatively small sample size, given the low number of published articles. Furthermore, we conducted a sensitivity analysis by excluding each study in turn to investigate the influence of the individual studies on the pooled estimates. While that analysis did not alter most primary analysis results, it did reveal that Xia et al.'s [17] and Demirok et al.'s [12] studies were the major source of statistical heterogeneity for TBUT and SIT respectively. This heterogeneity may have been due to the use of artificial tears in the SMILE group in Xia et al.'s study and design differences between Demirok et al.'s study and the others. Heterogeneity may also arise due to regional origin, changes in technology, and other factors, but that could not be explored formally because of the low number of included studies. A random effects model was used in outcomes with statistical heterogeneity to obtain a relatively conservative result.

Quality assessment showed that all included cohorts had good quality, although the RCT scored relatively poorly. Trials have found that three to six months are needed for corneal nerves to return to preoperative status after refractive surgery [27–30]. The follow-up visits in each included study went on for at least six months, which makes our conclusion practical and could help patients make more informed decisions.

In conclusion, the present meta-analysis suggests that dry eye after both SMILE and FS-LA-SIK usually occurs transiently. SMILE does not show obvious superiority over FS-LASIK by exhibiting similar and acceptable objective parameters, and SMILE may have milder subjective symptoms.

#### Supporting Information

**S1 Appendix. Search strategy of PubMed.** (DOCX)

**S2 Appendix. PRISMA-checklist in this meta-analysis.** (DOC)

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#### **Author Contributions**

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Supervision: KY.

Validation: XS KY.

Visualization: YZ JY.

Writing – original draft: ZS.

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