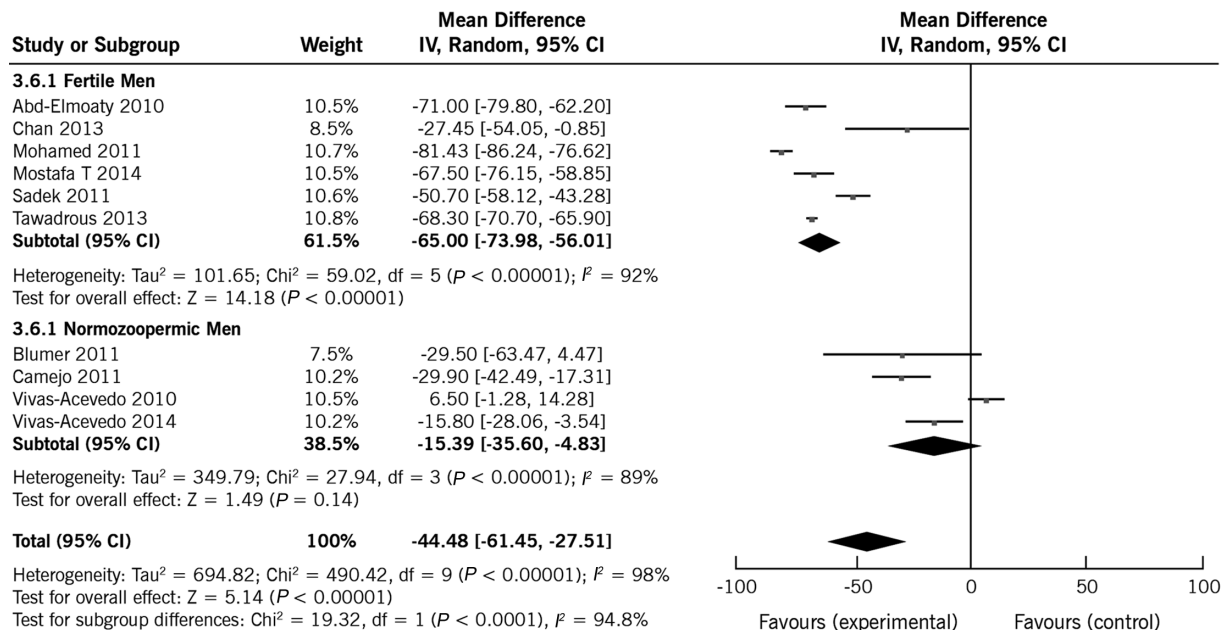


SUPPLEMENTARY MATERIAL

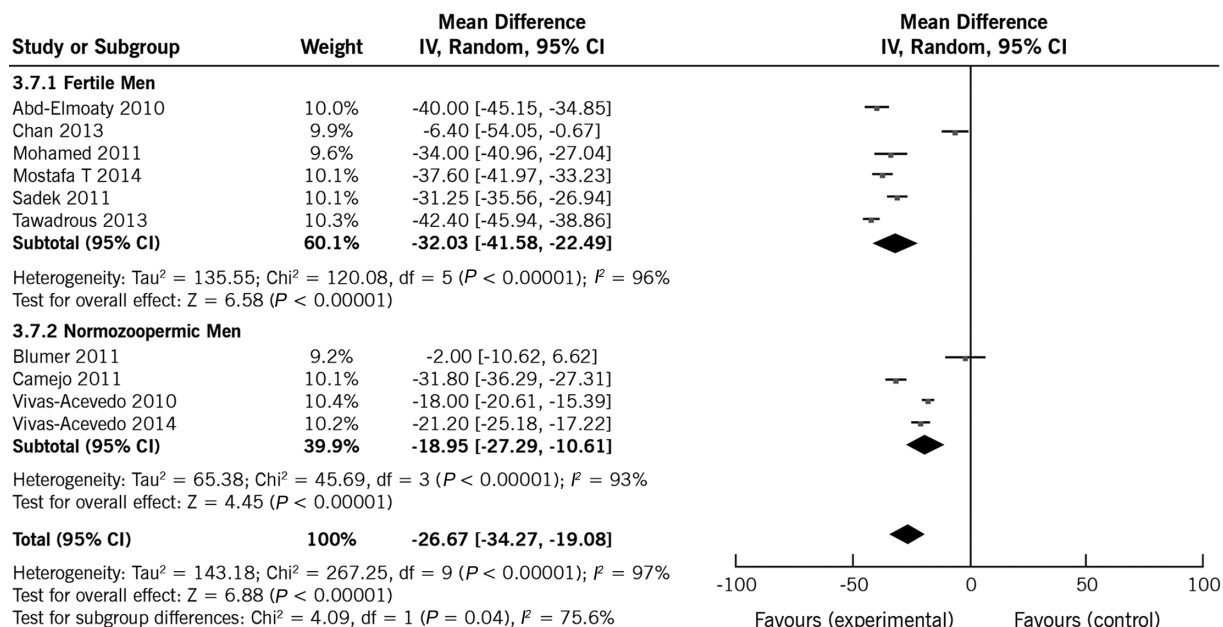
CONTENTS:

1. Assessment of heterogeneity according to type of controls
2. Sensitivity analysis
3. Publication bias

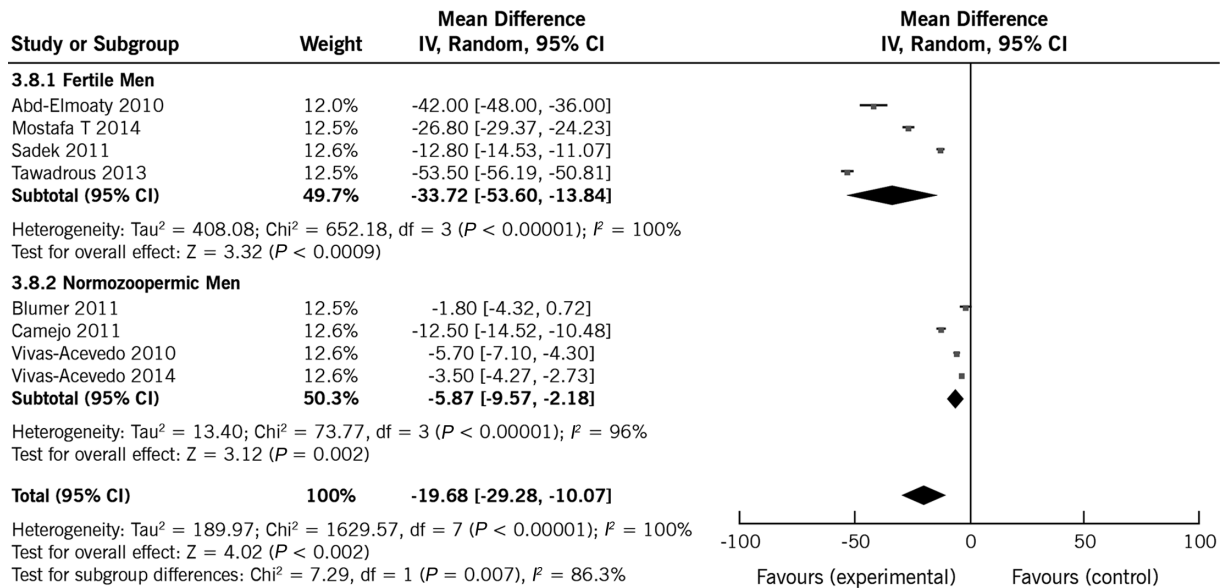
1. Assessment of heterogeneity according to type of controls



Supplementary Figure 1: Forest plot showing the effect of varicocele on sperm count according to control group type.



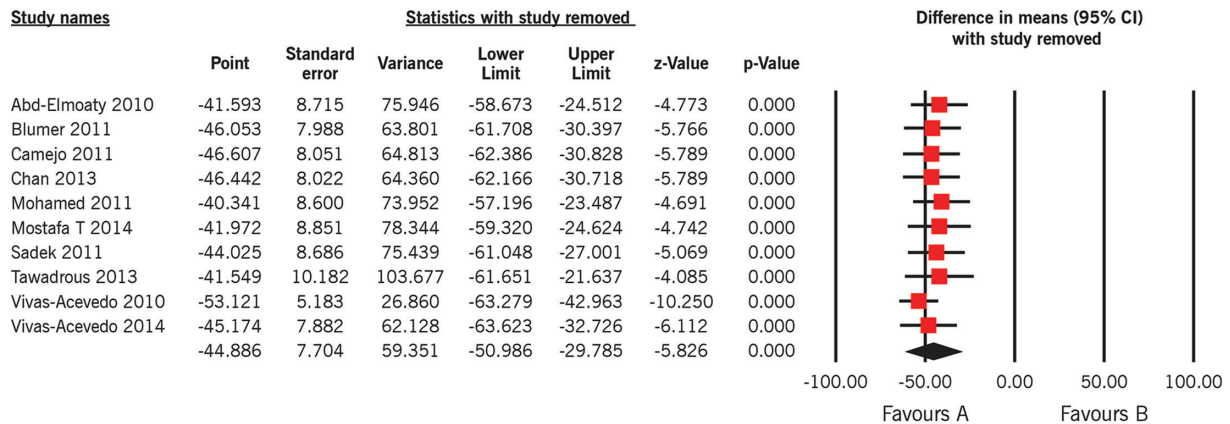
Supplementary Figure 2: Forest plot showing the effect of varicocele on sperm motility according to the control group type.



Supplementary Figure 3: Forest plot showing the effect of varicocele on sperm morphology according to the control group type.

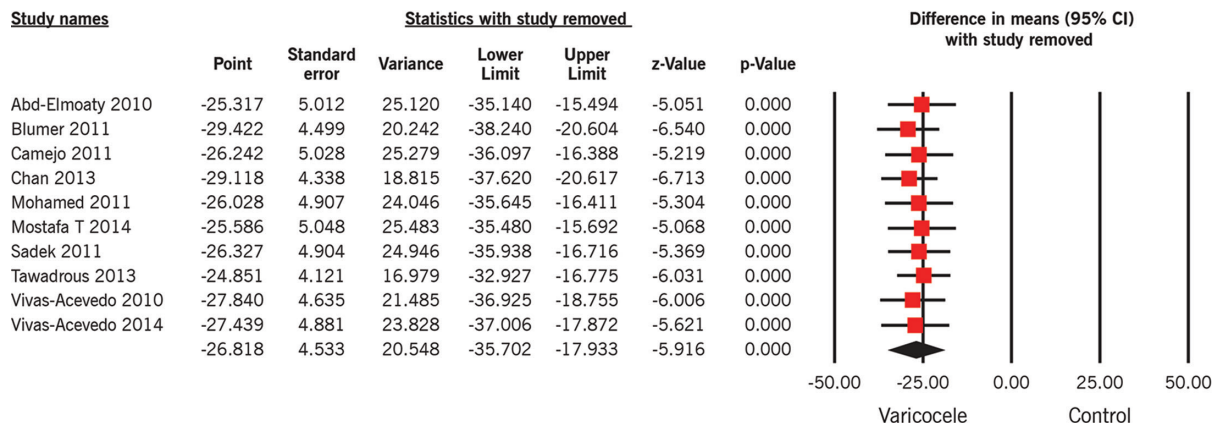
2. Sensitivity analyses

Sperm Count Meta-Analysis



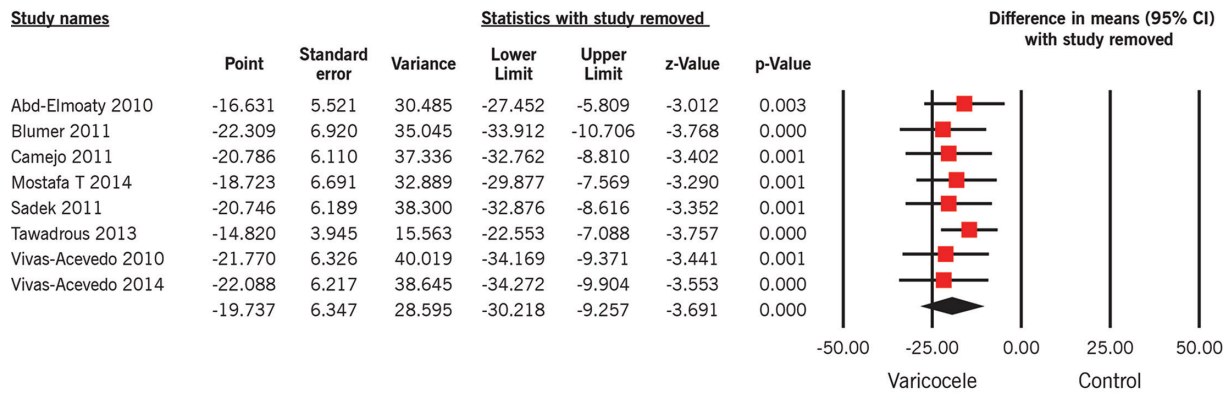
Supplementary Figure 4: Sensitivity analysis for the effect of varicocele on sperm count.

Sperm Motility Meta-Analysis



Supplementary Figure 5: Sensitivity analysis for the effect of varicocele on sperm motility.

Sperm Morphology Meta-Analysis



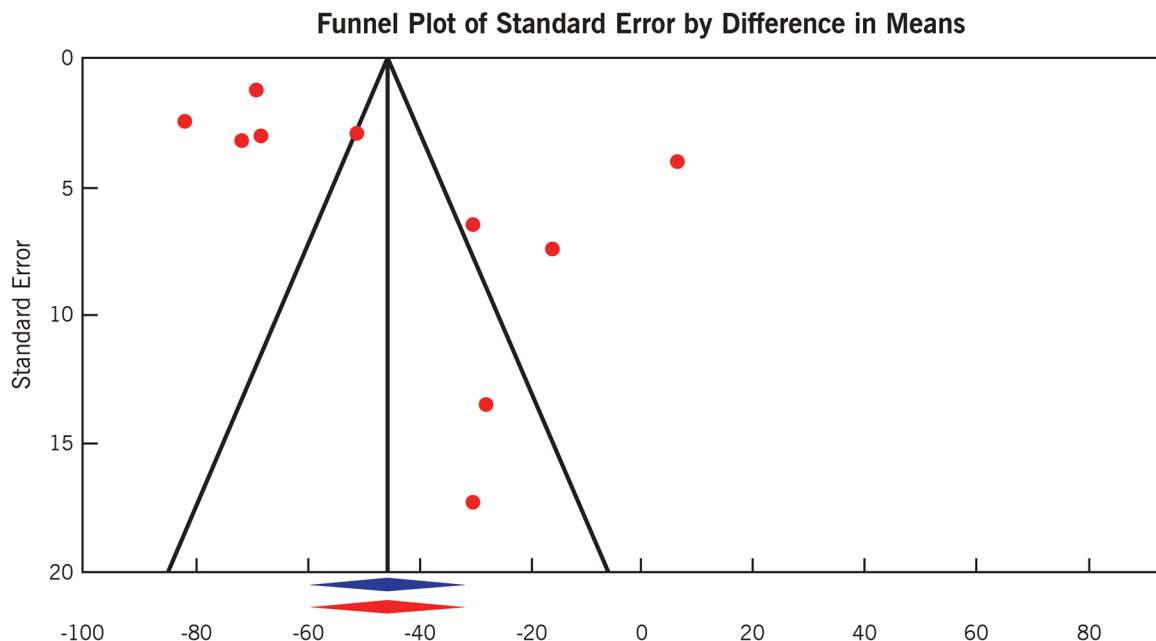
Supplementary Figure 6: Sensitivity analysis for the effect of varicocele on sperm morphology.

3. Publication bias

If the meta-analysis had captured all the relevant studies we would expect the funnel plot to be symmetric. That is, we would expect studies to be dispersed equally on either side of the overall effect. As seen in Supplementary Figure 7, the funnel plot is actually symmetric, with a similar number of studies falling toward the left and right of the mean effect. The tunnel plot results are confirmed by the 'trim-and-fill' method, which initially trims the asymmetric studies from the left-hand side to locate the unbiased effect (in an iterative procedure) and then fills the plot by re-inserting the trimmed studies on the left as well as their imputed counterparts to the right the mean effect.

The program is looking for missing studies, based on random effects models, only to the right side of the mean effect (these parameters are set by the user). Using these parameters, the method suggests that no studies are missing.

Under the fixed effect models, the point estimate (95% confidence interval) for sperm count in the combined studies is -63.04115 (-64.82480, -61.25751). Using trim-and-fill, these values are unchanged. Under the random effects models, the point estimate (95% confidence interval) for sperm count in the combined studies is -44.88577 (-59.98632, -29.78521). Using trim-and-fill, these values are unchanged (see Supplementary Table 1).



Supplementary Figure 7: Funnel plot for the meta-analysis of varicocele on sperm count.

Supplementary Table 1: Duval and Tweedie's trim and fill

	Fixed effects				Random effects			Q value
	Studies trimmed	Point estimate	Lower limit	Upper limit	Point estimate	Lower limit	Upper limit	
Observed values		-63.04115	-64.82480	-61.25751	-44.88577	-59.98632	-29.78521	468.63296
Adjusted values	0	-63.04115	-64.82480	-61.25751	-44.88577	-59.98632	-29.78521	468.63296