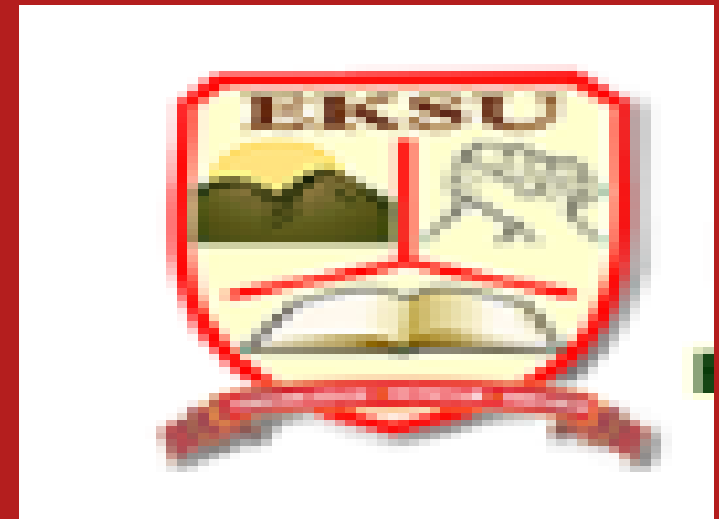




Systematic review and meta-analysis of association between oral contraceptives and cardiovascular disease (CVD) in premenopausal women

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Introduction

- Cardiovascular diseases (CVDs) are the leading cause of death worldwide, with low- and middle-income nations accounting for over three-quarters of CVD deaths¹.
- Meanwhile, the use of oral contraceptive is associated with an increased risk of cardiovascular events in women of reproductive age².

Aim

- To provide a comprehensive synthesis of the available evidence on the link between oral contraceptive use and CVD-risk in premenopausal women.
- To assess the role of geographic disparities.

Methodology

- This systematic review and meta-analysis was prepared according to the preferred reporting items for systematic reviews and meta-analysis (PRISMA) guidelines.

- Participants: **Healthy premenopausal women**
- Intervention: **Oral contraceptive**
- Comparator: **Premenopausal women not using oral contraceptives**
- Outcome: **Endothelia activation and cardiovascular risk variables.**

- The potential risk of bias of all included studies were assessed using the modified Downs and Black checklist.
- Data analysis were performed using the Review Manager (RevMan).

Results

- Briefly, 179 studies were screened after searching from inception till date.
- 25 were included in the review, while 15 studies were included in the meta-analysis.

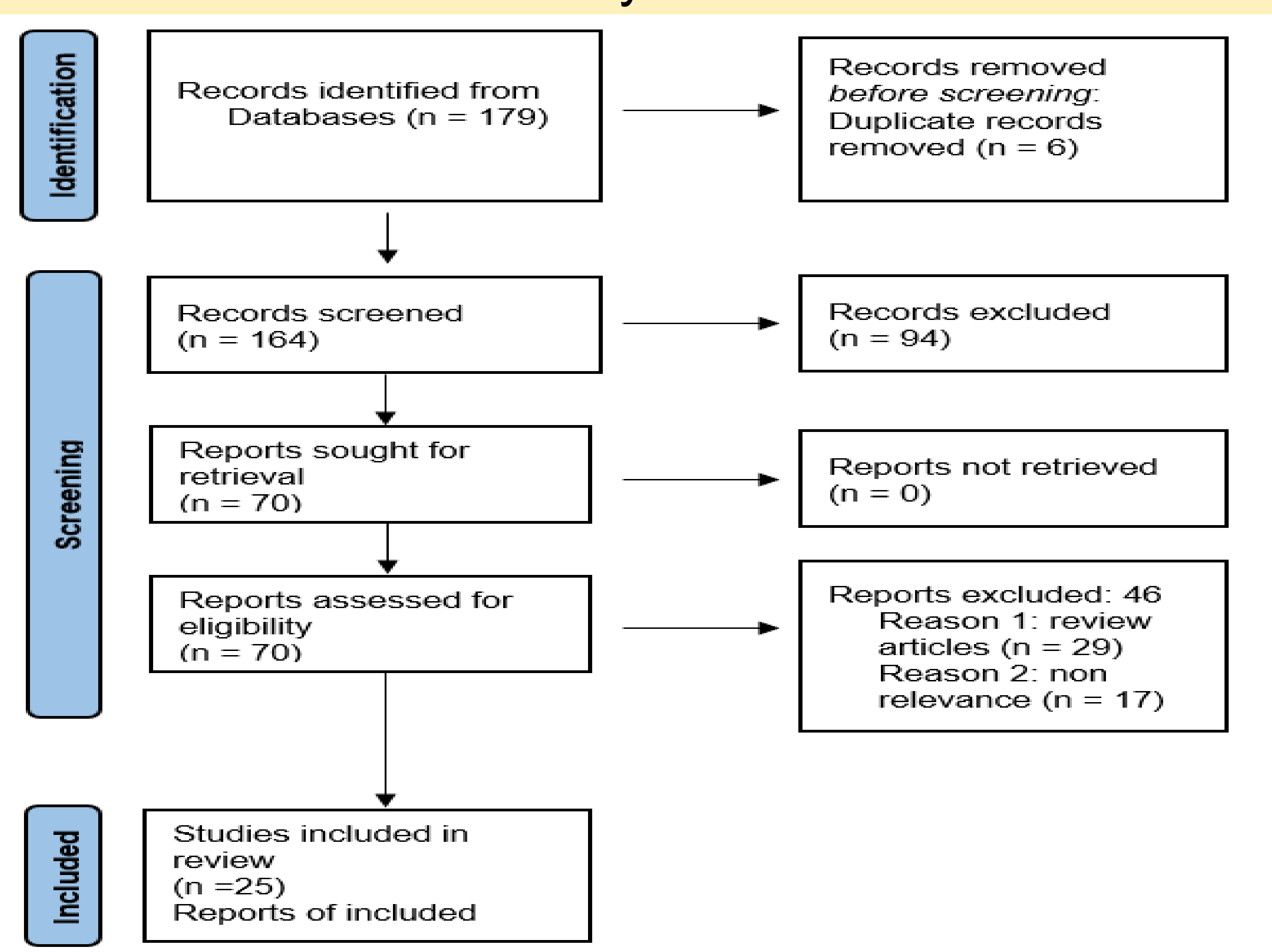


Figure 1: Prisma flow chart represents study selection

- There were 3245 participants of which 1605 (49.5%) were oral contraceptive users while 1640 (50.5%) were non-users.
- The pooled estimate in our forest plot (figure 2) showed little to no difference in endothelia activation among oral contraceptive users when compared with non-users (SMD = -0.11, 95% CI (-0.81, 0.60) ($I^2 = 94%$, $Z = 0.30$, $p = 0.76$).
- However, pooled estimates of other traditional cardiovascular risk variables showed a significant increased (SMD = 0.73, 95% CI (0.46, 0.99) ($I^2 = 94%$, $Z = 5.41$, $p < 0.001$).
- More so in terms of geographic disparities, Europe had the least effect size (SMD = 0.03, 95% CI (-0.21, 0.27), ($I^2 = 0%$, $Z = 0.25$, $p = 0.88$), while North America had the highest effect size (SMD = 1.86, 95% CI (-0.31, 4.04), ($I^2 = 98%$, $Z = 1.68$, $p = 0.09$) for CVD-risks in OC users when compared with non-users.

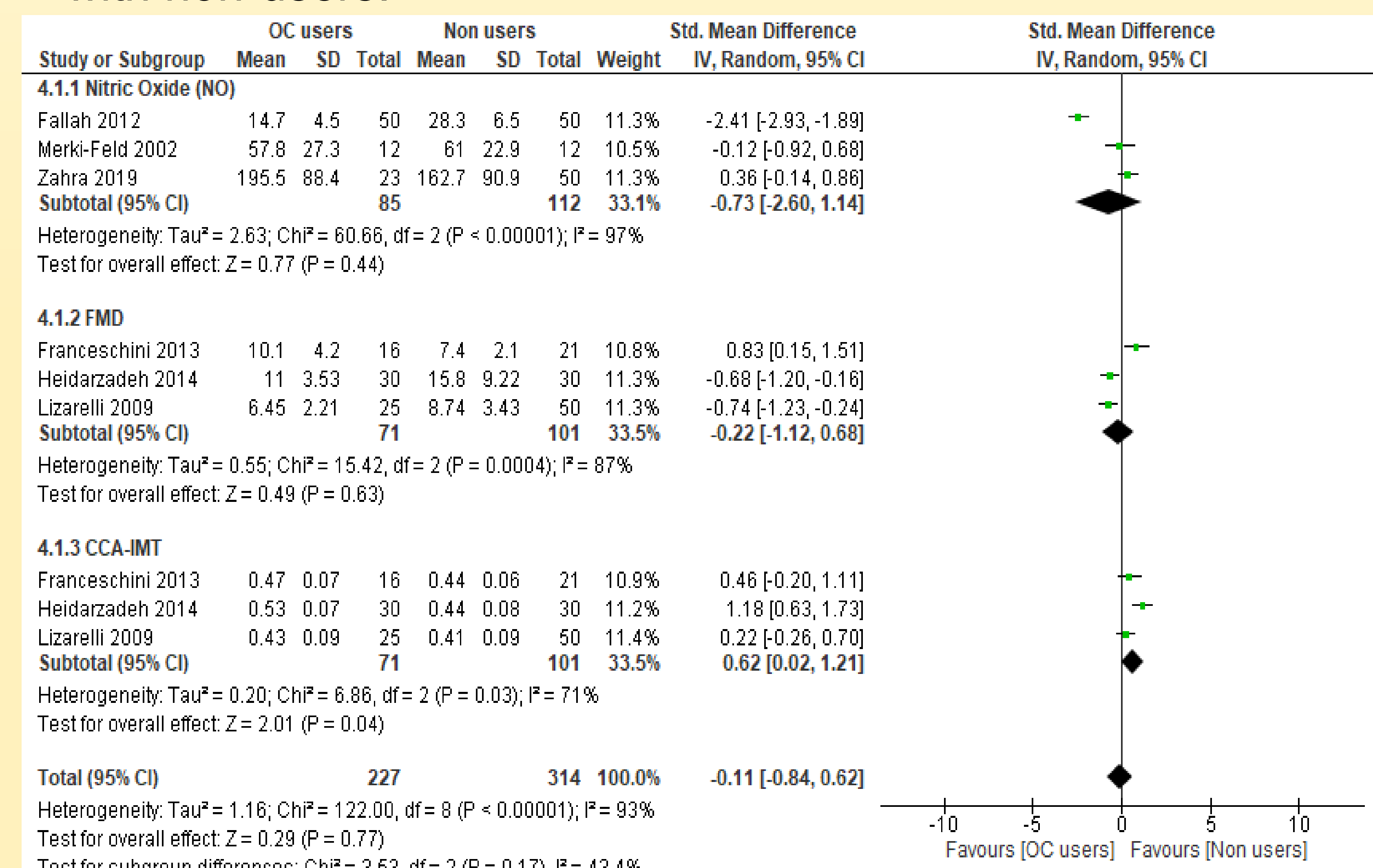


Figure 2: Forest plot of vascular and cellular markers of endothelia activation in premenopausal women on oral contraceptive versus nonusers. Abbreviations; FMD (flow mediated dilation), CCA-IMT (Common Carotid Artery Intima-Media thickness).

Conclusion

- Evidence from this systematic review and meta-analysis showed little to no difference in the risk of endothelia dysfunction among oral contraceptive users when compared with non-users.
- There was a significant increase in the prevalence of other traditional cardiovascular risk variables. Lastly, the magnitude of CVD-risks varies across different geographical region.

Acknowledgement

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References

- Centers for Disease Control and Prevention. Data and statistics on venous thromboembolism. Centers Dis. Control Prev.2020.
- Shufelt CL, Bairey Merz CN. Contraceptive Hormone Use and Cardiovascular Disease. *J Am Coll Cardiol* 2009;53:221–31. doi:10.1016/j.jacc.2008.09.042.