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GENERATION AND MOBILIZATION OF NUTRITION
EVIDENCE TO TACKLE MALNUTRITION: FROM DATA TO ACTION

Relative Effect of Multiple Micro Nutrients, Combined Iron Folic Acid and Folic Acid Supplementation during Preconception and Conception on Birth Outcomes –Systematic Reviews and Meta Analysis

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Introduction

- Women's nutrition before and during pregnancy play a key role in optimising pregnancy outcome ([Chavarro, J.E., et al., 2006](#)).
- Micronutrient deficiencies during pregnancy -associated with adverse pregnancy outcomes ([Dean, S.V., et al.,2014](#)).
- Supplements of multiple micro nutrients, iron and folic acid (IFA) and/or food-based supplements are among the most commonly recommended strategies for improving child birth outcomes ([Bhutta, Z.A., et al., 2013](#)).

Introduction...

- Women's nutritional status just before conception and during early pregnancy (<12 weeks gestation), influence pregnancy outcomes by affecting critical developmental processes that begin early in pregnancy (*Bloomfield FH, et al , 2004*)
- There were a conflicting finding on the effect of multiple micronutrient, combined iron folic acid and folic acid supplementations during preconception and conception on birth outcomes (*Christian, P., et al., 2003 and Ramakrishnan, U., et al.,2016*).

Introduction...

- Therefore this updated systematic review and Meta analysis was conducted to produce concrete evidence for policy implications in both developing and developed countries.

Objective- To estimate pooled relative effect of multiple micro nutrient, combined iron folic acid and folic acid supplementation during preconception and conception on birth outcome.

METHODS OF REVIEW

▪ Search Strategy

- ✓ Reviewed- study cohort (observational) and randomised controlled trials investigated on
- ✓ on multiple micro nutrients, folic acid and combined iron folic acid supplementation during preconception and conception
- ✓ birth outcomes of pregnant women which measured in kilo germs or germs
- ✓ MEDLINE (PubMed), EMBASE, the Cochrane Library, CINAHL and Registered filed trials of government
- ✓ Conducted in developed and developing countries from 2000 onwards.

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Search Strategy

- Keywords (index terms)

- ✓ *“preconception, conception, pregnancy, folic acid, iron folic acid, multivitamin, vitamin, mineral and supplement in combination with pregnancy, birth weight, preterm delivery, prematurity, and small for gestational age, low birth weight, developed and developing countries”.*

232 Published Article were identified from different data base

Excluded because they did not examine the effect of MM, IFA or FA supplementation on birth outcome (n-143)

Potentially appropriate references identified for review ($n = 89$)

Reference excluded (n=71)

Outcomes of interest like birth weight, small for gestational age and low birth weight were not measured as birth outcomes, duplication and poor quality design

Reference included in the meta-analysis ($n = 18$)

Birth weight (18 articles)

Low birth weight (5)

Small for gestational age ($n = 6$)

Data Aanalysis

- Carried out by STATA version 14.
- Meta analysis was conducted by taking individual studies of mean and standard deviation of birth weight data
- I^2 statistic -to determine the total variation among studies due to heterogeneity.
- publication bias was conducted by running funnel plot and egger test.

Operational Definition

- **Multiple micronutrients supplementation-** it is as a single tablet containing more than three different micronutrients [13].
- **Birth outcome** –in this review low birth weight (birth weight < 2500 g), measured by grams and the outcome is measured by mean and standard deviation [13].

Reviews Result

- After rigorous review, 4 observational and 13 interventional studies were identified.
- Of which 6 were conducted during preconception and the rest 11 were conducted during conception periods.

Pooled Effect of Multiple Micronutrients, Folic Acid And Iron Folic Acid Supplementation on Birth Weight

- The standard mean difference (SMD) of multiple micronutrients supplementation was 0.28 (0.19, 0.37) and 0.18(0.09, 0.26) during preconception and conception periods respectively.
- Preconception multiple micronutrient supplementation intervention had relatively better effect on birth weight as compared to conception period intervention.

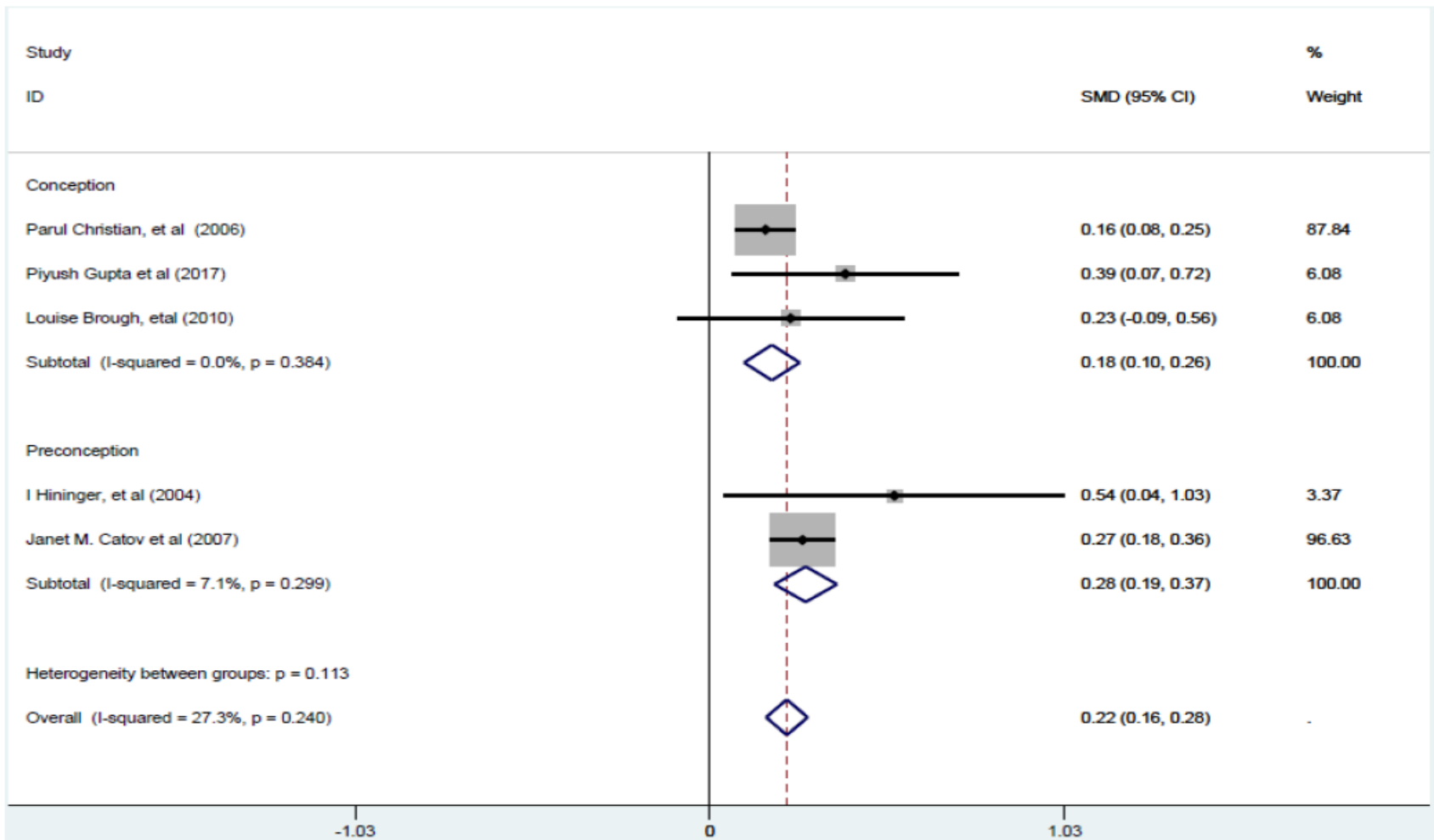


Fig.2. Estimated pooled SMD of multiple micronutrient supplementations during preconception and conception periods, 2020.

Con...

- The pooled estimated SMD folic acid supplementation was 0.26(0.20, 0.32) during preconception, 0.10(0.06, 0.15) during conception
- This Meta analysis confirmed that preconception folic acid supplementation had significant effect on improving birth weight.

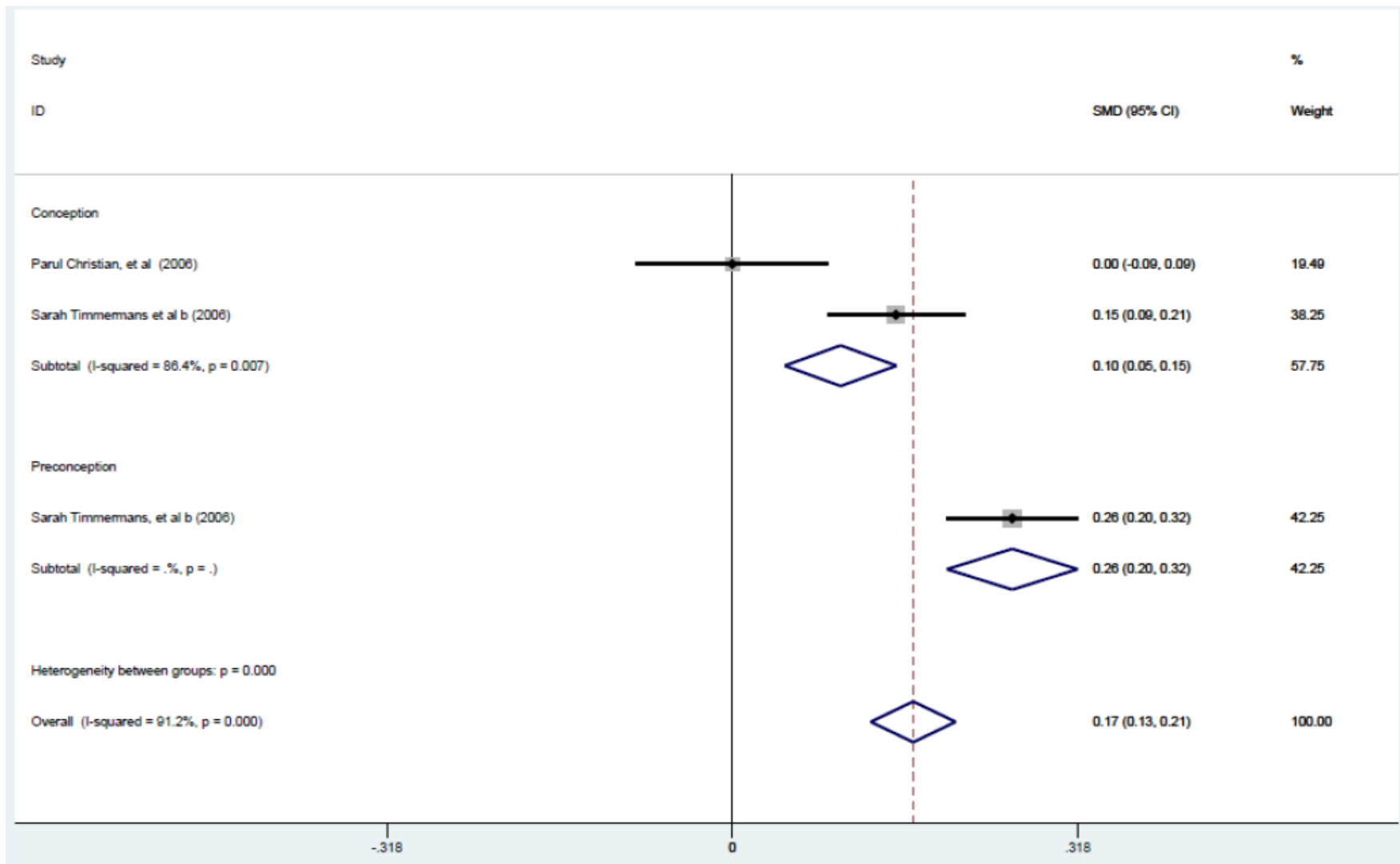
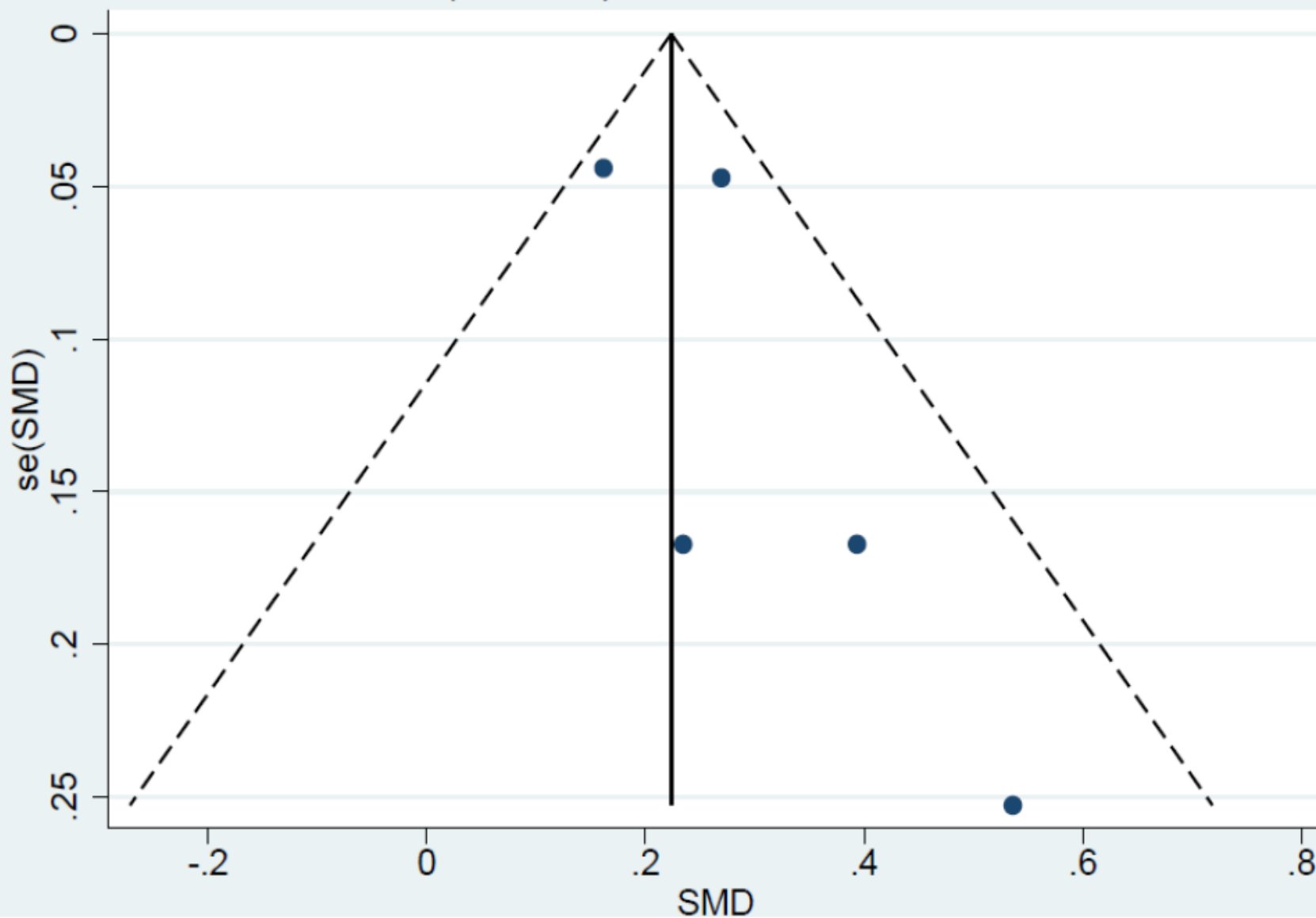


Fig. 3. The Estimated pooled SMD of folic acid supplementation during preconception and conception periods.

Funnel plot with pseudo 95% confidence limits



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Conclusion and Recommendation

- Over all multiple micronutrients intake during preconception had better birth outcomes as compared to supplementation during conception.
- The same effect was observed in folic acid supplementation when it started during preconception and early pregnancy within 12 weeks of gestation.
- combined iron folic acid and single folic acid supplementation had synergistic effect when it was given with multiple micronutrients during preconception and early pregnancy.

Conclusion and Recommendation...

- Multiple micronutrients supplementation including iron folic acid at the time of preconception and early (less than 12 weeks of gestation) is a safe strategy to improve pregnancy outcomes.

Reference

1. Dean, S.V., et al., *Preconception care: nutritional risks and interventions*. Reproductive health, 2014. **11**(S3): p. S3.
2. Kancherla, V., et al., *Prenatal folic acid use associated with decreased risk of myelomeningocele: A case-control study offers further support for folic acid fortification in Bangladesh*. PloS one, 2017. **12**(11).
3. Fernando E. Viteri and Jacques Berger, *Importance of Pre-Pregnancy and Pregnancy Iron Status: Can Long-Term Weekly Preventive Iron and Folic Acid Supplementation Achieve Desirable and Safe Status?*, *Nutrition Reviews*, 2005.