

Season 2 Session 5:
Health before Pregnancy to
Improve Outcomes

15 Mar 8–9pm GMT



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Guest Speaker:

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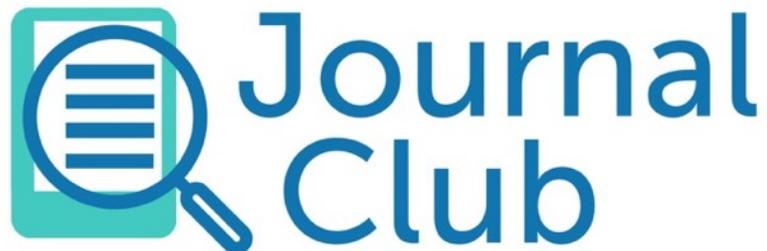


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Improving Preconception Health

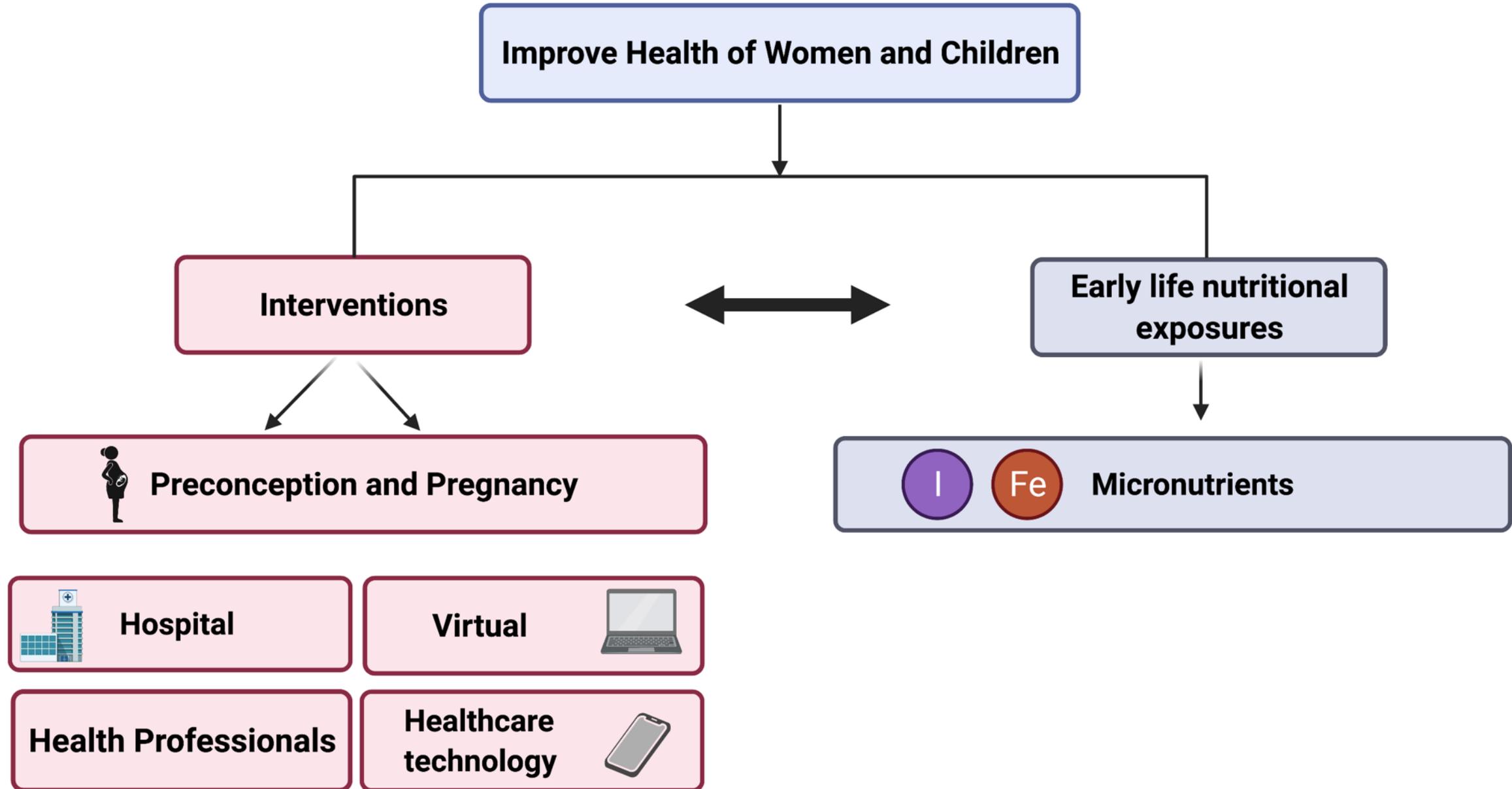
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What is preconception health

Preconception health

Describes “the health of women and men during their reproductive years, which are the years when they can have a child”⁷

Good preconception health encompasses two main concepts⁸



1. Planning pregnancy

Enabling women and their partners to choose if and when to start or grow their families

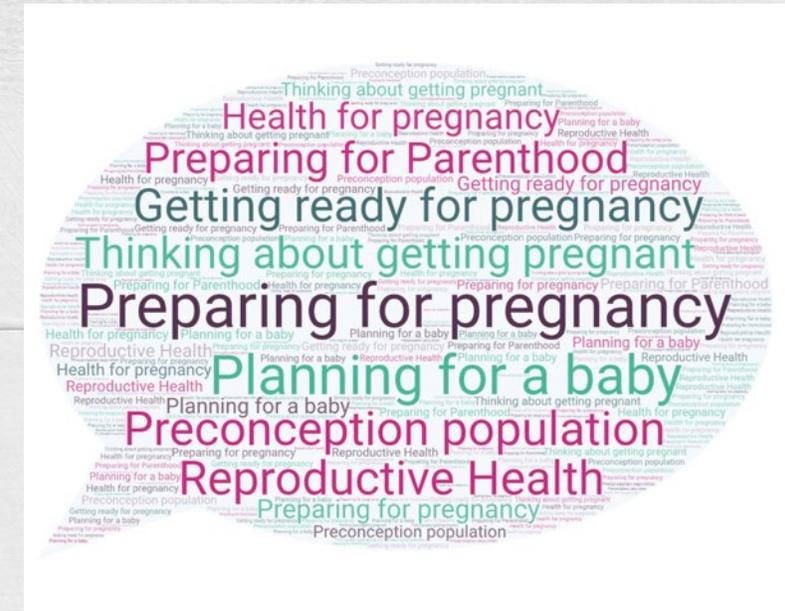


2. Fit for pregnancy

Recognising that many pre-pregnancy health behaviours and risk factors are amenable to change

Why is preconception health important

- Many of the health behaviours and risk factors for poor pregnancy outcomes are established before conception.
- In contrast, women who are healthier at conception have an increased chance of becoming pregnant, and having a healthy pregnancy.
- Modifications in pregnancy can be too little, too late.
- Interventions in pregnancy have shown some success in maternal behaviours, but little success on pregnancy complications such as GDM.



Stephenson *et al.*, 2018

Suboptimal Health; UK Women



Planning pregnancy (n=131,182)

- **54%** overweight or obese
- **20%** smoking
- **54.5%** alcohol consumption
- **31.5%** folic acid
- **53.3%** 5 portions fruit/veg
- **42%** <150min activity

McDougall....Flynn&White. *BMC Preg Childbirth* 2021



Pregnancy

- **50%** overweight or obese
- **11%** smoking at birth
- Unhealthy diets
- Micronutrient deficiencies
 - iron, iodine, vitamin D, folate/B12

Flynn et al. Int J Behav Nutr Phys Act, 2016

Flynn et al. Nutrients, 2018

Farebrother....Flynn. Eur J Clin Nutr, 2020

Welden...Flynn&White. J Dev Orig Health Dis, 2021

Heslehurst, Flynn et al. Nutrients 2021

National Maternity & Perinatal Audit, 2019

Tommy's

THE LANCET

Series



Preconception health 1

Before the beginning: nutrition and lifestyle in the preconception period and its importance for future health

Judith Stephenson, Nicola Heslehurst, Jennifer Hall, Danielle A J M Schoenaker, Jayne Hutchinson, Janet E Cade, Lucilla Poston, Geraldine Barrett, Sarah R Crozier, Mary Barker, Kalyanaraman Kumaran, Chittaranjan S Yajnik, Janis Baird, Gita D Mishra



Preconception health 2

Origins of lifetime health around the time of conception: causes and consequences

Tom P Fleming, Adam J Watkins, Miguel A Velazquez, John C Mathers, Andrew M Prentice, Judith Stephenson, Mary Barker, Richard Saffery, Chittaranjan S Yajnik, Judith J Eckert, Mark A Hanson, Terrence Forrester, Peter D Gluckman, Keith M Godfrey



Preconception health 3

Intervention strategies to improve nutrition and health behaviours before conception

Mary Barker, Stephan U Dombrowski, Tim Colbourn, Caroline H D Fall, Natasha M Kriznik, Wendy T Lawrence, Shane A Norris, Gloria Ngaiza, Dilisha Patel, Jolene Skordis-Worrall, Falko F Sniehotta, Régine Steegers-Theunissen, Christina Vogel, Kathryn Woods-Townsend, Judith Stephenson

NiPPeR

Keith M et al. Myo-Inositol, Probiotics, and Micronutrient Supplementation From Preconception for Glycemia in Pregnancy: NiPPeR International Multicenter Double-Blind Randomized Controlled Trial. *Diabetes Care* 1 May 2021; 44 (5): 1091–1099. <https://doi.org/10.2337/dc20-2515>

Background

- Dysglycemia and maternal micronutrient insufficiency preconception or in early pregnancy are common in the general population and thought to influence the risk of adverse pregnancy outcomes.



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Hypothesis

- Myo-inositol, probiotic, and micronutrient nutritional supplement commencing before pregnancy could collectively lower maternal glycemia and improve pregnancy outcomes across the general population



Intervention group	Daily amount	Rationale
Myo-inositol	4 g	Improves glucose metabolism and preliminary data suggest may maintain healthy glucose metabolism in pregnancy; dose safely used in pregnancy
Vitamin D ₃	400 IU	Deficiency highly prevalent and linked with glucose metabolism in pregnancy and offspring postnatal adiposity gain; dose sufficient to reduce insufficiency while avoiding potential concerns re adverse effects at high doses. Omission from control group supported by a <i>Lancet</i> study [56]
Vitamin B ₆	2.6 mg	Deficiency highly prevalent and linked with glucose metabolism in pregnancy and offspring postnatal adiposity gain [33]; dose sufficient to rectify deficiency and present in current over-the-counter products (e.g. Elevit). Omission from control group supported by usual clinical practice
Vitamin B ₁₂	5.2 µg	Deficiency highly prevalent and linked with glucose metabolism in pregnancy and offspring postnatal adiposity gain; dose sufficient to rectify deficiency and less than that in current over-the-counter products (e.g. Elevit). Omission from control group supported by usual clinical practice
Riboflavin	1.8 mg	Low intake highly prevalent and linked with offspring postnatal adiposity gain [34]; dose sufficient to rectify deficiency and present in current over-the-counter products (e.g. Elevit). Omission from control group supported by usual clinical practice
Zinc	10 mg	Deficiency highly prevalent and linked with offspring postnatal adiposity gain [unpublished]; dose sufficient to rectify deficiency and present in current over-the-counter products (e.g. Elevit). Omission from control group supported by usual clinical practice
β-carotene	720 µg (15% of vitamin A requirements, as retinol equivalents)	Required in pregnancy in some jurisdictions
Folic acid	400 µg	Standard preconception recommendation
Iron	12 mg	Iron is routinely prescribed and taken before/during pregnancy, though without convincing evidence of benefit; low dose included to lessen likelihood of additionally receiving a high-dose iron product, which has been linked with glucose metabolism in pregnancy
Calcium	150 mg	A low dose of calcium is commonly taken before/during pregnancy; provision of this will lessen the likelihood of additional products being taken
Iodine	150 µg	Standard preconception recommendation
Probiotic		Taking a combination of two probiotics has been linked with maintenance of healthy glucose metabolism in pregnancy. Probiotic capsule containing >1 × 10 ⁹ cfu each of <i>Lactobacillus rhamnosus</i> NCC 4007 (CGMCC 1.3724) also known as LPR and <i>Bifidobacterium animalis</i> sp. <i>lactis</i> NCC 2818 (CNCM I-3446) also known as BI818



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Methods

- Study design: Double blind RCT, multicentre-Singapore, Auckland, Southampton
- Target population: women planning to conceive within the next 6 months
- Both groups: folic acid, iron, calcium, iodine and b-carotene
- Intervention group: myo-inositol, vitamin D, riboflavin, vitamin B6 , vitamin B12, zinc and probiotics
- Primary outcome: Fasting and/or 1-h and/or 2-h plasma glucose concentrations following a 75-g OGTT at 28 weeks gestation



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Results

- 588 women reached 28 weeks, 292 (34%) of 859 and 296 (34%) of 870 in the control and intervention groups
- No difference in fasting, 1-h, and 2-h glucose
- No difference in GDM (24.8% vs. 22.6) and other secondary outcomes such as birthweight
- Fewer preterm births (5.8% vs. 9.2%, aRR 0.43 [0.22–0.82])



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Conclusion

- Supplementation with myo-inositol, probiotics, and multiple micronutrients preconception and in pregnancy did not lower gestational glycemia but did reduce preterm birth



Strengths and limitations

Strength

- Robust study design
- Multi-ethnic population
- Evidenced based intervention

Limitation

- Used a universal screening approach, did not target high risk women.
- Subgroup analysis of overweight/obese women or those with documented dysglycemia did not show any benefit-not powered.
- No data on prevalence of micronutrient deficiencies pre/post intervention (except Vit D).
- Others as suggested by authors no microbiome data to confirm validity of probiotic, lack of representation from other ethnic groups.

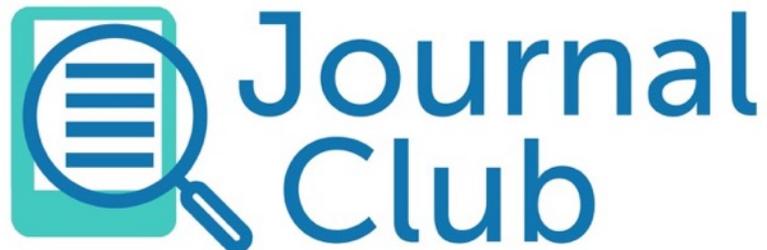
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