

5.1 Preconception risk factors

In women with PCOS and infertility, what are the preconception risk factors associated with poor or negative fertility outcomes?

Clinical need for the question

Preconception care is defined as a set of interventions that aim to identify and modify biomedical, behavioural, and social risks to a woman's health or pregnancy outcome through prevention and management, emphasising those factors that must be acted on before conception or early in pregnancy to have maximal impact. As women with PCOS often require infertility treatment, both the requirement for and the opportunity for preconception care is increased. Preconception care should include routine recommendations and PCOS specific considerations.

Modifiable risk factors that may impact fertility include body mass index (BMI), smoking status, alcohol consumption, pre-existing medical conditions such as diabetes and epilepsy, prescribed and recreational drug use, untreated sexually transmitted infections, nutritional status, supplementation requirements with folate, vitamin D, coeliac disease and dental health, which should be optimised as part of routine preconception care.

Pregnancy and fertility complications are features of PCOS including gestational diabetes, preterm birth, pre-eclampsia, miscarriage (see Chapter 4), longer time to conception and increased risk of ovarian hyperstimulation syndrome (OHSS). Anxiety and depression are also features of PCOS, with routine screening recommended. Body image and eating disorders are increased and should be considered and explored (see Chapter 2). All can impact relationship health and sexual intimacy and impact fertility treatment compliance.²⁷²

Summary of narrative evidence

Details of specific captured and included studies, patient populations and outcomes for this question can be found at technical report in [Section 5.1](#) and are summarised below.

Healthy weight versus BMI > 25 kg/m² in PCOS. Twenty studies reported on preconception BMI and/or weight in relation to fertility outcomes in PCOS ranging from observational to RCTs and across fertility treatments.

Most studies had moderate or low risk of bias and large sample sizes. For the purpose of this analysis, a BMI of 18.5 – 24.9 kg/m² or 'lean or normal weight', were compared to those with a BMI > 25 kg/m², or classified as of higher weight, with no upper limit.

Women with PCOS in the lean/normal weight category had a higher live birth rate across 16 studies (1.39 [1.17, 1.65]), and a biochemical (1.35 [1.11, 1.62]) and clinical (1.54 [1.09, 2.18]) pregnancy rate than those in the higher weight categories. Those in the lean/normal weight category had a higher ovulation rate per patient and per cycle and lower miscarriage rate per patient across 11 studies (0.64 [0.59, 0.71]) compared to the higher BMI category. Evidence certainty was very low to low for most outcomes, due primarily to observational study design, despite appropriate study design for this question.

Older versus younger Age Groups. Six studies examined age in relation to fertility outcomes in PCOS. Variations including analysis methods and age groups limited meta-analysis for most outcomes. Three were in IVF treatment and two (the ones pooled in meta-analysis) were with gonadotrophins. All studies identified were of moderate to low risk of bias and were observational. Meta-analyses from two studies on clinical pregnancy rate and OHSS, showed no significant difference between women aged < 35 years compared to > 35 years. Studies not pooled, also found no differences by age in most outcomes. One study reported a decline in pregnancy rate in women with PCOS undergoing IVF aged between 40 and 45, reducing from 24.4% at age 40 to 13.3% at age 44. Live birth rates decreased from 17.8% at age 40 to 6.7% at age 44. In contrast, miscarriage rates increased from 24.3% at age 40 to 50% at age 44 in the same cohort. Certainty of the evidence was low to very low.

