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Umbrella review - a useful tool when it's raining systematic reviews.

A mini commentary for Pittara et al. BJOG. 2021 (BJOG-20-2120.R1)

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Systematic reviews and accompanying meta-analyses of high-quality studies are at the top of the evidence pyramid. By synthesising the totality of evidence they can address a variety of clinical and research questions. Although they were initially effectiveness and safety of health interventions, systematic reviews (with or without meta-analysis) are now also common in the evaluation of diagnostic test accuracy, prognostic factors, prediction models, prevalence of disease, cost-effectiveness and other areas. With increasing numbers of systematic reviews, clinicians, consumers, and policy makers usually need to refer to a large number of systematic reviews to inform clinical decision-making.

This is also the case in our clinical field. For instance, pre-eclampsia is a very common condition in Obstetrics and can lead to multiple long-term maternal and neonatal complications. A quick search in Pubmed using "preeclampsia" as the title yields over 120 systematic reviews. These systematic reviews

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cover a wide range of questions on pre-eclampsia, including risk factors, treatment, diagnosis and prognosis. Even if we focus on the long-term outcomes alone, we will end up with a number of systematic reviews, each addressing different long-term complications. Can we have a “birds-eye” view on all long-term complications of preeclampsia in a more accessible way?

In this issue of BJOG, Pittara and colleagues reported an umbrella review involving 21 meta-analyses of 90 associations between preeclampsia and different long-term health outcomes in women and/or their offspring (Pittara et al. BJOG. 2021). The authors found that women with preeclampsia are associated with an increased risk of cardiovascular-related diseases, diabetes, and dyslipidaemia for the mother, and an increased risk for attention deficit/hyperactivity disorder for the offspring (Pittara et al. BJOG. 2021).

Umbrella reviews, also called overview or review of systematic reviews, are next-generation evidence synthesis methods, involving systematic searching, critically appraising and synthesizing evidence from systematic reviews (Hunt et al. Syst Rev. 2018.7(1):39). The most characteristic feature of umbrella reviews is that the unit of search, inclusion, risk of bias assessment and analysis is a systematic review, not a primary study. Therefore, umbrella reviews are usually used to address a broader scope of research questions compared to systematic reviews. For instance, they can be used to map multiple treatment options for the same condition, to evaluate a single treatment in multiple different populations, to examine the multiple outcomes of the same condition, to address multiple prognostic factors of the same condition or to assess discordance of results across different systematic reviews (McKenzie et al. Syst Rev. 2017. 6(1):185; Hunt et al. Syst Rev. 2018.7(1):39). We recently saw an example of an umbrella review in our field on different prognostic factors associated with stillbirth (Townsend, et al. BJOG. 2020. 128(2):238-250).

Given the breadth of knowledge synthesised in umbrella reviews, they are attractive to decision makers. They can clearly identify the weakness of included systematic reviews and therefore have the potential to drive improvements in the conduct and reporting of systematic reviews (McKenzie et al. Syst Rev. 2017. 6(1):185). However, like systematic reviews themselves, they cannot overcome a lack of high-quality primary studies, and this should always be borne in mind when interpreting data presented in umbrella reviews.

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