

Nutrition and maternal weight outcomes: annex 2 - selection of studies

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Chapter 3 (Methods) of the SACN report 'Nutrition and maternal weight outcomes' (2026) provides the eligibility criteria for studies to be included for consideration. The following sections show which studies did not meet the inclusion criteria and were excluded after full text screening. The section headings state the reason why the studies listed have been excluded. Links to records have been provided where available.

Duplicate data or subsequent update

Systematic reviews (SRs) that presented data that was already included in another eligible, better quality SR were excluded to prevent double-counting of primary studies. When an updated version of a SR was available, only the most recent and comprehensive version was included.

Kramer MS and Kakuma R. [Energy and protein intake in pregnancy](#). The Cochrane database of systematic reviews 2003: issue 4, page CD000032.

Muktabhant B, Lumbiganon P, Ngamjarus C and Dowswell T. [Interventions for preventing excessive weight gain during pregnancy](#). Cochrane Database of Systematic Reviews 2012: volume 4, issue 4, page Cd007145.

O'Brien EC, Segurado R, Geraghty AA, Alberdi G, Rogozinska E, Astrup A and others. [Impact of maternal education on response to lifestyle interventions to reduce gestational weight gain: individual participant data meta-analysis](#). BMJ Open 2019: volume 9, issue 8, page e025620.

Ota E, Tobe-Gai R, Mori R and Farrar D. [Antenatal dietary advice and supplementation to increase energy and protein intake](#). Cochrane Database of Systematic Reviews 2012: volume, issue 9, page Cd000032.

Rogozinska E, Marlin N, Jackson L, Rayanagoudar G, Ruifrok AE, Dodds J and others. [Effects of antenatal diet and physical activity on maternal and fetal outcomes: individual patient data meta-analysis and health economic evaluation](#). Health Technology Assessment 2017: volume 21, issue 41.

Thangaratinam S, Rogozinska E, Jolly K, Glinkowski S, Duda W, Borowiack E and others. [Interventions to reduce or prevent obesity in pregnant women: a systematic review](#). Health Technology Assessment 2012a: volume 16, issue 31.

Thangaratinam S, Rogozinska E, Jolly K, Glinkowski S, Roseboom T, Tomlinson JW and others. [Effects of interventions in pregnancy on maternal weight and obstetric outcomes: meta-analysis of randomised evidence](#). BMJ 2012b: volume 344, issue, page e2088.

Wrong publication type

Publications that did not meet the inclusion criteria of being SRs and meta-analyses (MAs) of randomised controlled trials (RCTs), non-randomised studies of interventions (NRSI) and prospective cohort studies were excluded.

Adegbeye ARA, Linne YM and Lourenco PMC. [Diet or exercise, or both, for weight reduction in women after childbirth](#). Cochrane Database of Systematic Reviews 2007: issue 3, page CD005627.

Agha M, Agha R and Sandall J. [Interventions to reduce and prevent obesity in pre-conceptual and pregnant women: A systematic review and meta-analysis](#). International Journal of Gynecology and Obstetrics 2012: page S268 (access required for full article).

Bonello B and others. [A systematic review of lifestyle interventions using social networks for weight management during pregnancy and postpartum \(PDF, 14.8MB\)](#). Obesity facts 2019: volume 12, page 165.

Crane M and others. 'Diet and exercise interventions for preventing gestational diabetes mellitus- a Cochrane Review'. Journal of Paediatrics and Child Health 2014: page 44.

Dalrymple K, Flynn A, Poston L and O'Keeffe M. [Preventing postpartum weight retention: lifestyle interventions in pregnancy, postpartum or both. A systematic review of the literature](#). Proceedings of the Nutrition Society 2018. Conference: Summer Meeting: volume 77, issue OCE4, page E185.

Dhillon P, Singh K and Kaur K. [The benefits of probiotic interventions in maternal-fetal health: An appraise review](#). PharmaNutrition 2020: volume 13.

Girard AW, Olude OA, Imhoff-Kunsch B, Ramakrishnan U and Martorell R. [Nutrition education and counseling during pregnancy: a systematic review](#). The FASEB Journal 2011. Conference: Experimental Biology: volume 25.

Hayes L, McParlin C, Azevedo LB, Jones D, Newham J, Olajide J and others. [The effectiveness of smoking cessation, alcohol reduction, diet and physical activity interventions in improving maternal and infant health outcomes: a systematic review of meta-analyses](#). Nutrients 2021: volume 13, issue 3.

International Weight Management in Pregnancy (i-WIP) Collaborative Group. [Effect of diet and physical activity based interventions in pregnancy on gestational weight gain and pregnancy outcomes: meta-analysis of individual participant data from randomised trials](#). Obstetrical and Gynecological Survey 2017: volume 72, issue 12, page 687 (subscription required for full article).

Lim S and others. [An evaluation of impact of lifestyle interventions on body weight in postpartum women: A systematic review and meta-analysis \(PDF, 14.8MB\)](#). Obesity facts, 2019a: volume 12, page 163.

Lim S, Liang X, Hill B, Teede H, Moran LJ and O'Reilly S. [A systematic review and meta-analysis of intervention characteristics in postpartum weight management using the TIDieR framework: A summary of evidence to inform implementation](#). Obesity Reviews 2019: volume 20, issue 7, page 1,045.

Lim SS and others. [Lifestyle interventions in postpartum women: a systematic review and meta-analysis of implementation characteristics](#). Obesity Research and Clinical Practice 2019b: volume 13, issue 3, page 310 (purchase required for full conference abstract).

Muktabhant B, Lumbiganon P and Ngamjarus C. 'Interventions for preventing excessive weight gain during pregnancy'. Cochrane Database of Systematic Reviews 2008: issue 2.

O'Brien EC and others. [Impact of education on lifestyle interventions to reduce gestational weight gain - individual participant data meta-analysis from the International Weight Management in Pregnancy \(i-WIP\) collaboration \(PDF, 83.7 MB\)](#). Obesity facts 2018: volume 11, page 184.

Smith AD, and others. [A meta-analysis of brief interventions aimed at promoting energy balance behaviours delivered during antenatal care](#). Obesity Reviews 2020. Conference: European and International Congress on Obesity, ECOICO: volume 21.

Soltani H. [Dietary interventions more effective than physical activity or mixed interventions for weight management during pregnancy](#). BMJ Evidence-Based Medicine 2013: volume 18, issue 2, page e12 (purchase or subscription required for full article).

Thangaratinam S, Marlin N, Dodds J, Kerry S, Riley RD, Mol BW and others. [Effects of diet and physical activity-based interventions on maternal and fetal outcomes in pregnancy-an individual patient data \(ipd\) meta-analysis of randomised trials](#). American Journal of Obstetrics and Gynecology 2017: volume 216, issue 1, page S352.

Van Der Pligt P and others. [Systematic review of lifestyle interventions to limit postpartum weight retention in women following childbirth \(PDF, 553.7KB\)](#). Journal of Paediatrics and Child Health 2013: page 52.

Weaver K. [Review: dietary restriction, with or without aerobic exercise, promotes weight loss in postpartum women](#). Evidence-Based Nursing 2008: volume 11, issue 1, page 14 (purchase or subscription required for full article).

Withdrawn

Publications that had been withdrawn because they were included in an updated review were excluded.

Kramer MS and Kakuma R. [Balanced protein/energy supplementation in pregnancy](#). Cochrane Database of Systematic Reviews 2000a: issue 2, page Cd000032.

Kramer MS. [Energy/protein restriction for high weight-for-height or weight gain during pregnancy](#). Cochrane Database of Systematic Reviews 2000b: issue 2, page Cd000080.

Kramer MS. [High protein supplementation in pregnancy](#). Cochrane Database of Systematic Reviews 2000c: volume, issue 2, page Cd000105.

Kramer MS. [Isocaloric balanced protein supplementation in pregnancy](#). Cochrane Database of Systematic Reviews 2000d: issue 2, page Cd000118.

Kramer MS. [Nutritional advice in pregnancy](#). Cochrane Database of Systematic Reviews 2000e: issue 2, page Cd000149.

Wrong setting

Publications were excluded if they were not conducted in settings and in countries deemed relevant to UK policy.

Hadju V, Dassir M, Sadapotto A, Putranto A, Marks G and Arundhana A. [Effects of moringa oleifera leaves and honey supplementation during pregnancy on mothers and newborns: a review of the current evidence](#). Open Access Macedonian Journal of Medical Sciences 2020: volume 8, page 208.

Wrong population

Publications were excluded if it was not possible to disaggregate results for adolescent girls aged 16 to 18 years.

Lassi ZS, Moin A, Das JK, Salam RA and Bhutta ZA. [Systematic review on evidence-based adolescent nutrition interventions](#). Annals of the New York Academy of Sciences 2017: volume 1393, issue 1, page 34.

No nutrition-only data

Publications which considered nutrition interventions in combination with physical activity (or other interventions), that is nutrition alone was not assessed, were excluded.

Agha M, Agha R and Sandall J. 'Interventions to reduce and prevent obesity in pre-conceptual and pregnant women: a systematic review and meta-analysis'. *Bjog-An international journal of obstetrics and gynaecology* 2013: page 25.

Amorim Adegbeye AR and Linne YM. [Diet or exercise, or both, for weight reduction in women after childbirth](#). Cochrane Database of Systematic Reviews 2013: issue 7.

Bailey C, Skouteris H, Teede H, Hill B, De Courten B, Walker R and others. [Are lifestyle interventions to reduce excessive gestational weight gain cost effective? A systematic review](#). *Current Diabetes Reports* 2020: volume 20, issue 2, page 1.

Bain E, Crane M, Tieu J, Han S, Crowther CA and Middleton P. [Diet and exercise interventions for preventing gestational diabetes mellitus](#). Cochrane Database of Systematic Reviews 2015: issue 4.

Beauchesne AR, Cara KC, Chen J, Yao Q, Penkert LP, Yang W and others. [Effectiveness of multimodal nutrition interventions during pregnancy to achieve 2009 Institute of Medicine gestational weight gain guidelines: a systematic review and meta-analysis](#). *Annals of Medicine* 2021: volume 53, issue 1, page 1,179.

Berger AA, Peragallo-Urrutia R and Nicholson WK. [Systematic review of the effect of individual and combined nutrition and exercise interventions on weight, adiposity and metabolic outcomes after delivery: evidence for developing behavioral guidelines for post-partum weight control](#). *BMC pregnancy and childbirth* 2014: volume 14, page 319.

Bijlholt M, Van UytSEL H, Ameye L, Devlieger R and Bogaerts A. [Eating behaviors in relation to gestational weight gain and postpartum weight retention: A systematic review](#). *Obesity reviews* 2020: volume 21, issue 10.

Brown MJ, Sinclair M, Liddle D, Hill AJ, Madden E and Stockdale J. [A systematic review investigating healthy lifestyle interventions incorporating goal setting strategies for preventing excess gestational weight gain](#). *PloS one* 2012: volume 7, issue 7, page e39503.

Campbell F, Johnson M, Messina J, Guillaume L and Goyder E. [Behavioural interventions for weight management in pregnancy: a systematic review of quantitative and qualitative data](#). *BMC public health* 2011: volume 11, page 491.

Cantor AG, Jungbauer RM, McDonagh M, Blazina I, Marshall NE, Weeks C and others. [Counseling and behavioral interventions for healthy weight and weight gain in pregnancy: evidence report and systematic review for the US Preventive Services Task Force](#). *Jama* 2021: volume 325, issue 20, page 2,094.

Carlson NS, Leslie SL and Dunn A. [Antepartum care of women who are obese during pregnancy: systematic review of the current evidence](#). *Journal of midwifery and women's health* 2018: volume 63, issue 3, page 259.

Dodd JM, Crowther CA and Robinson JS. [Dietary and lifestyle interventions to limit weight gain during pregnancy for obese or overweight women: a systematic review](#). *Acta obstetricia et gynecologica Scandinavica* 2008: volume 87, issue 7, page 702.

Gardner B, Wardle J, Poston L and Croker H. [Changing diet and physical activity to reduce gestational weight gain: a meta-analysis](#). *Obesity reviews* 2011: volume 12, issue 7, page e602.

Hoedjes M, Berks D, Vogel I, Franx A, Visser W, Duvekot JJ and others. [Effect of postpartum lifestyle interventions on weight loss, smoking cessation, and prevention of smoking relapse: a systematic review](#). *Obstetrical and gynecological survey* 2010: volume 65, issue 10, page 631.

Keller C, Records K, Ainsworth B, Permana P and Coonrod DV. [Interventions for weight management in postpartum women](#). *Journal of Obstetric, Gynecologic and Neonatal Nursing* 2008: volume 37, issue 1, page 71.

Lau Y, Klainin-Yobas P, Htun T, Wong S, Tan K, Ho-Lim S and others. [Electronic-based lifestyle interventions in overweight or obese perinatal women: a systematic review and meta-analysis](#). *Obesity reviews* 2017: volume 18, issue 9, page 1,071.

Lim S, Hill B, Teede HJ, Moran LJ and O'Reilly S. [An evaluation of the impact of lifestyle interventions on body weight in postpartum women: A systematic review and meta-analysis](#). *Obesity Reviews* 2020: volume 21, issue 4, page e12990.

Lim S, O'Reilly S, Behrens H, Skinner T, Ellis I and Dunbar JA. [Effective strategies for weight loss in post-partum women: a systematic review and meta-analysis](#). *Obesity Reviews* 2015: volume 16, issue 11, page 972.

Michel S, Raab R, Drabsch T, Günther J, Stecher L and Hauner H. [Do lifestyle interventions during pregnancy have the potential to reduce long-term postpartum weight retention? A systematic review and meta-analysis](#). *Obesity Reviews* 2019: volume 20, issue 4, page 527.

Mohsenzadeh-Ledari F, Taghizadeh Z, Motaghi Z, Keramat A, Moosazadeh M and Najafi A. [Appropriate Interventions for Pregnant Women with Indicators of Metabolic Syndrome on Pregnancy Outcomes: A Systematic Review](#). International Journal of Preventative Medicine 2019: volume 10, issue, page 2.

Muktabhant B and others. 'Diet or exercise, or both, for preventing excessive weight gain in pregnancy'. Cochrane Database of Systematic Reviews 2012: issue 4.

Neville CE, McKinley MC, Holmes VA, Spence D and Woodside JV. [The effectiveness of weight management interventions in breastfeeding women--a systematic review and critical evaluation](#). Birth 2014: volume 41, issue 3, page 223.

O'Brien CM, Grivell RM and Dodd JM. [Systematic review of antenatal dietary and lifestyle interventions in women with a normal body mass index](#). Acta Obstetrica et Gynecologica Scandinavia 2016: volume 95, issue 3, page 259.

Oteng-Ntim E, Varma R, Croker H, Poston L and Doyle P. [Lifestyle interventions for overweight and obese pregnant women to improve pregnancy outcome: systematic review and meta-analysis](#). BMC Medicine 2012: volume 10, issue 1, page 47.

Peaceman AM, Clifton RG, Phelan S, Gallagher D, Evans M, Redman LM and others. [Lifestyle Interventions Limit Gestational Weight Gain in Women with Overweight or Obesity: LIFE-Moms Prospective Meta-Analysis](#). Obesity 2018: volume 26, issue 9, page 1,396.

Ronnberg AK and Nilsson K. [Interventions during pregnancy to reduce excessive gestational weight gain: a systematic review assessing current clinical evidence using the Grading of Recommendations, Assessment, Development and Evaluation \(GRADE\) system](#). BJOG 2010: volume 117, issue 11, page 1,327.

Sherifali D, Nerenberg KA, Wilson S, Semeniuk K, Ali MU, Redman LM and others. [The Effectiveness of eHealth Technologies on Weight Management in Pregnant and Postpartum Women: Systematic Review and Meta-Analysis](#). Journal of Medical Internet Research 2017: volume 19, issue 10, page e337.

Streuling I, Beyerlein A and von Kries R. [Can gestational weight gain be modified by increasing physical activity and diet counseling? A meta-analysis of interventional trials](#). American Journal of Clinical Nutrition 2010: volume 92, issue 4, page 678.

Tanentsapf I, Heitmann BL and Adegbeye AR. [Systematic review of clinical trials on dietary interventions to prevent excessive weight gain during pregnancy among normal weight, overweight and obese women](#). BMC Pregnancy Childbirth 2011: volume 11, issue 1, page 81.

van der Pligt P, Willcox J, Hesketh KD, Ball K, Wilkinson S, Crawford D and others. [Systematic review of lifestyle interventions to limit postpartum weight retention: implications for future opportunities to prevent maternal overweight and obesity following childbirth](#). Obesity Reviews 2013: volume 14, issue 10, page 792.

Vincze L, Rollo M, Hutchesson M, Hauck Y, MacDonald-Wicks L, Wood L and others. [Interventions including a nutrition component aimed at managing gestational weight gain or postpartum weight retention: a systematic review and meta-analysis](#). JBI Database of Systematic Reviews and Implementation Reports 2019: volume 17, issue 3, page 297.

Wrong study designs

Publications that did not meet the inclusion criteria of being SRs and meta-analyses (MAs) of randomised controlled trials (RCTs), non-randomised studies of interventions (NRSI) and prospective cohort studies were excluded.

Craemer KA, Sampene E, Safdar N, Antony KM and Wautlet CK. [Nutrition and exercise strategies to prevent excessive pregnancy weight gain: a meta-analysis](#). American Journal of Perinatology Reports 2019: volume 9, issue 1, page e92.

Nielsen JN, Gittelsohn J, Anliker J and O'Brien K. [Interventions to improve diet and weight gain among pregnant adolescents and recommendations for future research](#). Journal of the American Dietetic Association 2006: volume 106, issue 11, page 1,825.

No relevant outcomes

Publications that did not include data on maternal weight outcomes were excluded.

Bennett CJ, Walker RE, Blumfield ML, Gwini SM, Ma J, Wang F and others. [Interventions designed to reduce excessive gestational weight gain can reduce the incidence of gestational diabetes mellitus: A systematic review and meta-analysis of randomised controlled trials](#). Diabetes Research and Clinical Practice 2018: volume 141, page 69.

Guo XY, Shu J, Fu XH, Chen XP, Zhang L, Ji MX and others. [Improving the effectiveness of lifestyle interventions for gestational diabetes prevention: a meta-analysis and meta-regression](#). BJOG 2019: volume 126, issue 3, page 311.

Rhodes A, Smith AD, Chadwick P, Croker H and Llewellyn CH. [Exclusively digital health interventions targeting diet, physical activity, and weight gain in pregnant women: systematic review and meta-analysis](#). JMIR mHealth uHealth 2020: volume 8, issue 7, page e18255.

Voortman T, van den Hooven EH, Braun KV, van den Broek M, Brammer WM, Chowdhury R and others. [Effects of polyunsaturated fatty acid intake and status during pregnancy, lactation, and early childhood on cardiometabolic health: A systematic review](#). Progress in Lipid Research 2015: volume 59, issue, page 67.