

**Table S4:** Description of physical activity interventions aimed at preventing excessive gestational weight gain.

First author	Setting and date	Population	Intervention	GWG <sup>a</sup> and GWG measure	Quality <sup>b</sup>
Bacchi <sup>86</sup>	Buenos Aires, Argentina	Singleton and uncomplicated pregnancy. Excluded: Contraindication to exercise, not planning to deliver at study hospital. Sample: 140 (70 int, 70 con) Final analyses: (49 int, 62 con)	Aquatic PA, 55-60 mins, 3 days per week. Aerobic and strength exercises. Duration: 26 weeks	Int: 12.7±2.6 Con: 13.9±4.3 $p = 0.1$ GWG: First prenatal visit – 37 weeks	Random: Low AC: Low Blinding: Unclear Data: Unclear SR: Low Other: Low
Barakat <sup>72</sup> 2013	Madrid, Spain Sep 2007 – Jan 2011	Singleton pregnancy, sedentary, no contraindications to exercise. Sample: 510 (255 int, 225 con) Final analyses: 210 int, 218 con	Group exercise classes, 50-55 mins, 3 days per week. Aerobic, muscle strength and flexibility activities. Duration: 28 weeks	Int: 11.6±3.7 Con: 13.3±4.1 $p < 0.01$ GWG: Pre-pregnancy - delivery	Random: Unclear AC: Unclear Blinding: Unclear Data: Low SR: High Other: Unclear
Barakat <sup>73</sup>	Madrid, Spain	Singleton pregnancy. Excluded: Not planning to give birth at study hospital, contraindications to exercise. Sample: 80 (40 int, 40 con) Final analyses: 34 int, 33 con	Group exercise classes, 35-45 mins, 3 days per week. Warm-up, core session of toning and very light resistance exercise, and cool-down. Duration: 33 weeks	Int: 11.9±3.1 Con: 13.9±2.1 $p < 0.03$ GWG: Pre-pregnancy - delivery	Random: Low AC: Unclear Blinding: Unclear Data: Low SR: Unclear Other: Unclear
Barakat <sup>70</sup>	Madrid, Spain Jan 2000 - Mar 2002	Singleton pregnancy, sedentary, no risk of preterm delivery, no contraindications to exercise. Sample: 160 (80 int, 80 con) Final analyses: 72 int, 70 con	Group exercise classes, 35-40 mins, 3 days per week. Sessions were individually controlled and consisted of light-moderate PA. Duration: 26 weeks	Int: 11.5±3.7 Con: 12.4±3.4 $p > 0.1$ GWG: Baseline - delivery	Random: Unclear AC: Unclear Blinding: Unclear Data: Unclear SR: High Other: Unclear
Barakat <sup>71</sup>	Madrid, Spain Dec 2011 – Jan 2015	Singleton pregnancy. Excluded: diabetes or GDM at baseline, risk of preterm delivery. Sample: 840 (420 int, 420 con) Final analyses: 382 int 383 con	Group exercise classes, 50-55 mins, 3 days per week. Warm-up, core session of moderate resistance exercise, and cool-down. Duration: 30 weeks	Int: 12.1±3.7 Con: 12.9±4.5 $p = 0.01$ GWG: Pre-pregnancy – last weight before delivery	Random: Low AC: Unclear Blinding: Unclear Data: Low SR: Unclear Other: Unclear
Barakat <sup>69</sup>	Madrid, Spain	Singleton pregnancy Excluded: Contraindications such as CVD, risk of premature labour, diabetes. Sample: 100 (50 int, 50 con) Final analyses: 40 int, 43 con	Group exercise classes, 35-45 mins, 3 days per week, 2 x land-based and 1 aquatic. Warm- up, core session of light resistance activities, and cool-down. Duration: 30 weeks	Int: 12.5±3.2 Con: 13.8±3.1 $p > 0.05$ GWG: Pre-pregnancy - delivery	Random: Unclear AC: Unclear Blinding: Unclear Data: Low SR: Unclear Other: Unclear

Barakat <sup>74</sup>	Madrid, Spain	Singleton pregnancy. Excluded: Contraindications to exercise. Sample: 320 (160 int, 160 con) Final analyses: 138 int 152 con	Group exercise classes, 55-60 mins, 3 days per week. Warm- up, core session of toning and resistance activities, and cool-down. Duration: 30 weeks	Int: 11.9±3.7 Con: 13.7±4.1 $p < 0.01$ GWG: Pre-pregnancy - delivery	Random: Low AC : Unclear Blinding: Unclear Data: Low SR: High Other: Unclear
Barakat <sup>87</sup>	Madrid Spain Mar 2014 – Jan 2017	Singleton and uncomplicated pregnancy. Excluded: Contraindications to exercise, not planning to deliver at study hospital. Sample: 508 (255 int, 253 con) Final analysis: 176 int, 149 con	Supervised PA program, 55-60 mins, 3 days per week consisting of aerobic and resistance exercises. Duration: 30 weeks	Int: 12.0±3.3 Con: 12.8±3.9 $p = 0.1$ GWG: Baseline – 37 weeks	Random: Low AC: Low Blinding: Unclear Data: Unclear SR: Low Other: Unclear
Bisson <sup>82</sup>	Quebec, Canada Oct 2011 - Nov 2013	Singleton pregnancy, > 18 years, obese. Excluded: Contraindications to exercise, a high level of pre-gestational exercise. Sample: 50 (25 int, 25 con) Final analyses: 23 int, 22 con	A 12-week, supervised exercise program at a hospital-based centre. Participants were individually supervised once a week and invited to 2 more sessions per week. On non-training days women were encouraged to be as active as possible. Duration: 12 weeks	Int: 12.3±4.0 Con: 12.2±5.9 $p = 0.03$ GWG: Pre-pregnancy - delivery	Random: Low AC: Low Blinding: Unclear Data: Low SR: Low Other: Low
Cavalcante <sup>78</sup>	Sao Paulo, Brazil Mar 2002 - Nov 2004	Singleton pregnancy, 16-20 weeks gestation, sedentary. Excluded: > 2 caesarean births, contraindication to exercise. Sample: 71 (34 int 37 con) Final analyses: 34 int, 37 con	Water aerobic classes, 50 mins, 3 days per week. Sessions were in an indoor swimming pool and involved moderate-intensity exercises so that women worked at 70% capacity. Duration: 20-24 weeks	Int: 14.3±2.1 Con: 15.1±1.6 $p = 0.38$ GWG: Pre-pregnancy - delivery	Random: Low AC: Low Blinding: Unclear Data: Unclear SR: Unclear Other: High
Clapp <sup>76</sup>	Ohio, United States	Singleton pregnancy, enrolled before conception. Excluded: Substance use, premature labour, HTN, GDM, IUGR, failure to maintain exercise regimen. Sample: 46 randomized Final analyses: 22 int, 24 con	Weight-bearing exercise, 20 minutes, three to five times per week at an intensity between 55-60% of capacity. Duration: 30 weeks	Int: 15.7±4.7 Con: 16.3±3.4 <i>Not significant</i> GWG: Pre-pregnancy - delivery	Random: Unclear AC: Unclear Blinding: Unclear Data: Low SR: Unclear Other: Unclear

Clapp <sup>34</sup>	Ohio, United States	Singleton pregnancy, enrolled before conception, regularly exercising. Excluded: Substance use, premature labour, mid-trimester bleeding, HTN, GDM, IUGR, failure to maintain exercise regimen. Sample: 80 randomized Final analyses: 26 Lo-Hi, 24 Mod-Mod, 25 Hi-Lo	<i>Lo-Hi:</i> Weight-bearing exercise (treadmill, step aerobics or stair stepper) 20 mins, 5 days per week until week 20, then gradually increasing to 60 mins by week 24 and maintain until the end of pregnancy. <i>Mod-Mod:</i> Weight-bearing exercise (treadmill, step aerobics or stair stepper) 40 mins, 5 days per week from 8 weeks to end of pregnancy <i>Hi-Lo:</i> Weight-bearing exercise (treadmill, step aerobics or stair stepper) 60 mins, 5 days per week until week 20, then gradually decreasing to 20 mins by the end of pregnancy. Duration: 32 weeks	Lo-Hi: 12.0±4.1 Mod-Mod: 14.6±4.4 Hi-Lo: 15.5±4.5 <i>GWG was significantly less in the Lo-Hi group</i> $p < 0.02$ GWG: Pre-pregnancy - delivery	Random: Unclear AC: Unclear Blinding: Unclear Data: Unclear SR: Unclear Other: Unclear
Daly <sup>89</sup>	Dublin, Ireland Nov 2013 – Apr 2016	Singleton pregnancy, > 18 years, <17 weeks gestation, BMI > 30, English speaking. Excluded: Pre-existing diabetes, HTN, medications affecting insulin sensitivity Sample: 88 randomized Final analyses: 34 int, 42 con	Supervised exercise classes, 50-60 mins, 3 days per week. Duration: 27 weeks	Int: 6.2±6.0 Con: 7.9±4.8 $p = 0.15$ GWG: Baseline - 36 weeks	Random: Low AC: Low Blinding: Unclear Data: Unclear SR: High Other: Low
Da Silva <sup>88</sup>	Pelotas, Brazil Apr 2014 – Mar 2016	Singleton pregnancy, > 18 years, physically inactive. Excluded: HTN, CVD, diabetes, history of miscarriage, preterm birth, BMI > 35, heavy smoker. Sample: 639 (213 int, 426 con) Final analyses: 85 int, 407 con	Structured, individually supervised, moderate intensity exercise program, 60 mins, 3 days per week. Duration: 24 weeks	Int: 12.7±5.7 Con: 12.9±6.5 $p = 0.2$ GWG: Baseline – 36 weeks	Random: Low AC: Unclear Blinding: Unclear Data: Unclear SR: Low Other: Unclear
Dekker Nitert <sup>84</sup>	Brisbane, Australia	Singleton pregnancy, >12 weeks gestation, obese. Excluded: Contraindication to exercise, non-English speaking, type 1 diabetes, anemia, heart or lung disease, cerclage, hyperthyroidism, poorly controlled seizures, heavy smoker. Sample: 50 randomized Final analyses: 19 int, 16 con	At baseline, all participants attended a group education session regarding exercise, nutrition and GWG. Women were given an individualised exercise plan and attended monthly face-to-face consultations with physiotherapists. Duration: 26 weeks	Int: 7.9±4.0 Con: 8.3±6.1 $p = 0.81$ GWG: Baseline – 36 weeks	Random: Unclear AC: Unclear Blinding: Unclear Data: High SR: Low Other: Unclear
Garnaes <sup>90</sup>	Trondheim, Norway Sept 2010 – Mar 2015	Singleton pregnancy, >18 years, <18 weeks gestation, BMI > 28. Excluded: Preterm labour risk, disease that could interfere with the intervention, habitual exercise.	Supervised exercise classes, 60 mins, 3 days per week. In addition, women asked to follow a home-based 50-min program 1 day per week. Duration: 23 weeks	Int: 10.5±0.8 Con: 9.2±1.2 $p = 0.35$ GWG: Baseline - delivery	Random: Low AC: Low Blinding: Unclear Data: Low SR: Unclear

		Sample: 91 (46 int, 45 con) Final analyses: 38 int, 36 con			Other: Low
Garshasbi <sup>77</sup>	Tehran, Iran Apr 2003 - Jan 2004	Singleton pregnancy, 20-28 years, 17-22 weeks gestation, housewives or high-school graduates. Excluded: Contraindications to aerobic exercise, exercise before pregnancy, orthopaedic disease. Sample: 266 (161 int, 105 con) Final analyses: 107 int, 105 con	60 min program for strengthening abdominal muscles consisting of 15 movements, 3 days per week. Supervised by a midwife. Duration: 18-23 weeks	Int: 14.1±3.8 Con: 13.8±5.2 $p = 0.63$	Random: Unclear AC: Low Blinding: Unclear Data: High SR: Unclear Other: Unclear
Haakstad <sup>79</sup>	Oslo, Norway Sep 2007 - Mar 2008	Singleton pregnancy, < 24 weeks gestation, nulliparous, not in exercise program in the 6 months before pregnancy. Excluded: > 2 miscarriages, heart disease, persistent bleeding after 12 weeks, poorly controlled thyroid disease, HTN, pre-eclampsia. Sample: 105 (52 int, 53 con) Final analyses: 14 int, 53 con	A 12-week program of 60 mins supervised dance classes, at least twice a week. Women advised to participate in moderate PA of on remaining days. Duration: 12 weeks	Int: 11.0±2.0 Con: 13.8± 4.0 $p = 0.01$ GWG: Pre-pregnancy– 36 weeks	Random: Low AC: Unclear Blinding: Low Data: Low SR: Unclear Other: Low
Kong <sup>81</sup>	Iowa, United States	Singleton pregnancy, 18-45 years, overweight or obese, < 3, 30 min sessions of PA 6 months before enrolment. Excluded: History of chronic disease such as CVD, thyroid disease, prior GDM, smoking. Sample: 42 (19 int, 23 con) Final analyses: 18 int, 19 con	An unsupervised walking program consisting of a safety training session regarding 30 mins of leisure activity according to guidelines. Women were given a treadmill for intervention and encouraged to walk in any setting. Duration: 22 weeks	Overweight int: 10.5±5.4 Overweight con: 9.9±6.1 <i>Not significant</i> Obese int: 12.1±9.0 Obese con: 12.5±8.5 <i>Not significant</i> GWG: Baseline – 36 weeks	Random: Low AC: Low Blinding: Low Data: Low SR: Unclear Other: Low
Nascimento <sup>80</sup>	Sao Paulo, Brazil Aug 2008- Mar 2010	Singleton pregnancy, ≥18 years, 14-24 weeks gestation, BMI ≥26kg/m <sup>2</sup> . Excluded: multiple gestations, contraindications to exercise. Sample: 82 (40 int, 42 con) Final analyses: 39 int, 41 con	A weekly group exercise class consisting of stretching, upper and lower limb strengthening and relaxation. Women were encouraged to walk 5 days per week. Duration: 20 weeks	Int: 10.3±5.0 Con: 11.5±7.4 $p = 0.54$ GWG: Pre-pregnancy - 38/39 weeks	Random: Low AC: Unclear Blinding: Unclear Data: Low SR: Unclear Other: Unclear
Nobles <sup>35</sup>	Massachusetts, United States 2007 – 2012	High risk of GDM Excluded: Already physically active, <18 years and >40 years, >20 weeks, unable to read English. Sample: 290 (143 PA, 147 H&W) Final analyses: 118 PA, 123 H&W	PA: Face-to-face counselling at baseline, followed by weekly and bi-weekly phone calls with tailored PA advice H&W: Mailings of brochures related to general pregnancy health and wellbeing. Duration: 12 weeks	PA: 12.9±8.3 H&W: 13.8±9.0 $p = 0.39$ GWG: Pre-pregnancy - delivery	Random: Unclear AC: Unclear Blinding: Unclear Data: Low SR: Unclear Other: Unclear

Oostdam <sup>85</sup>	Amsterdam Netherlands Jan 2007 - Jan 2011	Singleton pregnancy, overweight or obese with previous GDM, macrosomia or first-grade relative with T2DM. Excluded: > 20 weeks gestation, < 18 years, GDM, HTN, alcohol or drug use, other health complications. Sample: 121 (62 int, 59 con) Final analyses (ITT): 40 int, 45 con	2 x 60 minute PA sessions with aerobic and strength exercises supervised by a physiotherapist at participating hospital. Duration: 25 weeks (women also followed up 12 weeks post-partum).	Int: 6.2±5.0 <sup>c</sup> Con: 5.6±3.5 <sup>c</sup> <i>Not significant</i> GWG: Baseline - 32 weeks	Random: Low AC: Low Blinding: Unclear Data: Unclear SR: Low Other: Low
Perales <sup>45</sup>	Madrid, Spain Oct 2009 - Jan 2013	Singleton pregnancy, overweight or obese. Excluded: Obstetric complications. Sample: 129 (65 int, 64 con) Final analyses: 52 int, 54 con	Group exercise program, 55-60 mins, three times per week. Warm up, core aerobic activities, and cool down. Duration: 30 weeks	Int: 46.8% <sup>d</sup> Con: 67.3% <sup>d</sup> $p = 0.03$ GWG: Pre-pregnancy - delivery.	Random: Low AC: Unclear Blinding: Unclear Data: Low SR: low Other: Unclear
Rodriguez-Blaque <sup>92</sup>	Granada, Spain Mar 2016 – Apr 2016	Singleton pregnancy, 12-20 weeks. Excluded: Contraindications to PA Sample: 140 (70 int, 70 con) Final analyses: 65 int, 65 con	Aquatic PA sessions, 60 mins, 3 days/week. Duration: 17 weeks	Int: 8.3±2.8 Con: 11.2±3.5 $p < 0.01$ GWG: 12 – 36 weeks	Random: Low AC: Unclear Blinding: Unclear Data: Unclear SR: Unclear Other: Unclear
Ronnberg <sup>83</sup>	Örebro, Sweden Jun 2007 - Mar 2010	Singleton pregnancy, ≥18 years old, <16 weeks gestation. Excluded: BMI <19kg/m <sup>2</sup> , history of an eating disorder, obstetric complications, IUGR, chronic illness. Sample: 445 (221 int 224 con) Final analyses: 192 int, 182 con	Individual education session regarding IOM GWG guidelines and PA prescription issued by a midwife. Weight gain monitored on chart. Duration: 30 weeks	Int: 14.2±4.5 Con: 15.3±5.4 $p = 0.029$ GWG: First pre-natal visit - delivery	Random: Unclear AC: Unclear Blinding: Unclear Data: High SR: Unclear Other: Unclear
Ruiz <sup>75</sup>	Madrid, Spain Sep 2007 - Jan 2011	Singleton pregnancy, sedentary, not at risk of preterm delivery. Excluded: Contraindication to exercise Sample: 962 (481 int, 481 con) Final analyses: 481 int, 481 con	Group exercise classes, 55-60 mins, 3 days per week. Session consisted of a warm-up, core session of moderate intensity aerobic and resistance exercises, and cool-down. Duration: 30 weeks	Int: 11.9±3.8 Con: 13.2±4.3 $p < 0.01$ GWG: First prenatal visit - delivery	Random: Low AC: Unclear Blinding: Unclear Data: Low SR: Low Other: Low
Wang <sup>91</sup>	Peking, China Dec 2014 – Jul 2016	Singleton pregnancy, >18 years, <12 weeks gestation, BMI > 24, non-smoker. Excluded: Cervical insufficiency, pre-existing chronic disease, metformin, corticosteroids. Sample: 300 (150 int, 150 con) Final analyses: 112 int, 114 con	Supervised cycling program, 30 mins, 3 days per week. Duration: 27 weeks	Int: 8.4±3.7 Con: 10.5±3.3 $p < 0.01$ GWG: Baseline - delivery	Random: Low AC: Low Blinding: Unclear Data: Low SR: Unclear Other: Unclear

<sup>a</sup> Gestational weight gain (kg): mean (standard deviation) unless otherwise stated.

<sup>b</sup>Based on Cochrane Collaboration Risk of Bias. Random = Randomization; AC = Allocation concealment; Blinding = Blinding of participants, personal and outcome; Data = Incomplete data; SR = Selective reporting; Other = Other bias.

<sup>c</sup>Intention to treat data.

<sup>d</sup>Percentage that experienced excessive GWG according to Institute of Medicine recommendations.

Other acronyms and abbreviations in alphabetical order: BMI = body mass index, Con = control group, CVD = cardiovascular disease, GDM = gestational diabetes mellitus, GWG = gestational weight gain, Hi = high, HTN = hypertension, Int = intervention group, IOM = Institute of Medicine, IUGR = intrauterine growth restriction, Lo = low, PA = Physical Activity, T2DM = type 2 diabetes mellitus.