

Table D.1.f. Adverse effects and physical activity, pregnant and postpartum women

Black font is from original GRADE Evidence Profile from the systematic review (Davenport 2019 (2)) to support the 2019 Canadian Guideline for Physical Activity Throughout Pregnancy. **No new systematic reviews were identified that addressed the relationship between physical activity and delivery complications.**

Quality assessment							№ of participants		Effect		Quality	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Prenatal exercise	no exercise	Relative (95% CI)	Absolute (95% CI)		
Association between exercise-only interventions and miscarriage												
10 ^a	randomized trials	serious ^b	not serious	not serious	serious ^c	none	22/1160 (1.9%)	30/1088 (2.8%)	OR 0.69 (0.40 to 1.22)	8 fewer per 1 000 (from 6 more to 16 fewer)	⊕⊕○○ LOW	CRITICAL
							Additional data from study included in the pooled estimate. Ussher (2015) indicated no effect of prenatal exercise on the odds of miscarriage after adjustment for recruitment centre [as a stratification factor]. ^d					
1	Non-randomized intervention studies	not serious	serious ^e	not serious	not serious ^f	none	1/33 (3.0%)	1/61 (1.6%)	OR 1.88 (0.11 to 30.98)	14 more per 1 000 (from 15 fewer to 324 more)	⊕○○○ VERY LOW	CRITICAL
3 (pooled estimate of effect, n = 2 ^g ; 1 study reported narratively)	cohort studies	serious ^h	not serious	not serious	serious ^c	none	21/621 (3.4%)	11/244 (4.5%)	OR 0.60 (0.27 to 1.36)	18 fewer per 1 000 (from 15 more to 32 fewer)	⊕○○○ VERY LOW	CRITICAL
							Narrative Summary: One cohort study of 92,671 women (Madsen, 2007) found a progressive increase in the odds of miscarriage with increasing exercise volume. Exercising more than 7 hours/week before 18 weeks gestation was associated with a 3.7 higher odds of miscarriage. However, secondary analyses that included only women who were interviewed about exercise habits prior to a miscarriage (approximately 1/3 of the cohort) revealed that the association was no longer significant (Nilsson 2014).					

Quality assessment							№ of participants		Effect		Quality	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Prenatal exercise	no exercise	Relative (95% CI)	Absolute (95% CI)		
2	case-control studies	serious ⁱ	not serious	not serious	serious ^c	none	Narrative Synthesis: One case-control study (case, n=267; control, n=285; Zhang, 2011) reported a protective dose-response effect of exercise on miscarriage (after adjusted for several potential confounding factors). In contrast, Maconochie (2007) found no association between different levels of exercise compared to rare or no exercise and odds of miscarriage (cases, n=603; controls, n=6116, adjusted for year of conception, maternal age, previous miscarriage and previous live birth).				⊕○○○ VERY LOW	CRITICAL
Association between exercise-only interventions and stillbirth												
6	randomized trials	serious ^j	not serious	not serious	serious ^c	none	5/860 (0.6%)	6/791 (0.8%)	OR 0.79 (0.26 to 2.38)	2 fewer per 1 000 (from 6 fewer to 10 more)	⊕⊕○○ LOW	CRITICAL
							Additional data from study included in the pooled estimate. Ussher (2015) indicated no effect of prenatal exercise on the odds of stillbirth after adjustment for recruitment centre [as a stratification factor]. ^d					
3 ^k	Non-randomized intervention studies	serious ^l	serious ^l	not serious	serious ^c	none	1/47 (2.1%)	1/43 (2.3%)	OR 1.00 (0.06 to 16.93)	0 fewer per 1 000 (from 22 fewer to 264 more)	⊕○○○ VERY LOW	CRITICAL
2 (pooled estimate of effect, n = 1 ^m ; 1 study reported narratively)	cohort studies	serious ⁿ	serious ^e	not serious	not serious ^f	none	9/533 (1.7%)	6/216 (2.8%)	OR 0.72 (0.25 to 2.05)	8 fewer per 1 000 (from 21 fewer to 28 more)	⊕○○○ VERY LOW	CRITICAL
							Narrative Summary: One study (n=59,573) found no effect of exercising > once/week on odds of stillbirth compared to no exercise (Magnus, 2008).					
1	cross-sectional studies	serious ^o	serious ^e	not serious	not serious ^f	none	6/839 (0.7%)	33/1718 (1.9%)	OR 0.37 (0.15 to 0.88)	12 fewer per 1 000 (from 2 fewer to 16 fewer)	⊕○○○ VERY LOW	CRITICAL

Quality assessment							№ of participants		Effect		Quality	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Prenatal exercise	no exercise	Relative (95% CI)	Absolute (95% CI)		
							Additional data from study included in the pooled estimate. Dumith (2012) reported results that were adjusted for potential confounding factors and found no association between exercise and stillbirth (adjusted for maternal age, marital status, level of schooling, family income, parity, prenatal consultation and twin delivery). ^d					
1	case-control studies	serious ^p	serious ^e	not serious	not serious ^f	none	Narrative Summary: Xu (2014) (n= 620 cases; n=1,240 controls) reported a protective effect of exercising 30 minutes ≥2 times/week compared to not exercising (adjusted for history of miscarriage, previous induced abortion, frequency of night shift, frequent staying up late, regular physical exercise, smoking, and alcohol consumption).				⊕○○○ VERY LOW	CRITICAL

Abbreviations: CI = confidence interval; OR = odds ratio

^a One study reported no cases of miscarriage (not estimable result) and is not included in the pooled analysis.

^b Serious risk of bias. High risk of performance bias and other bias (all women who were included in one study were smokers, a risk factor for miscarriage).

^c Serious imprecision. The 95% CI crosses the line of no effect, and is wide, such that the interpretation of data would be different if the true effect were at one end of the CI or the other.

^d One study reported data that was included in the meta-analysis and additional data reported narratively. This study was counted only once.

^e Serious inconsistency. Only one study was included.

^f No serious imprecision; only one study but already downgraded for serious inconsistency for this reason.

^g Two studies reported data on different sub-groups of women. These studies were counted only once.

^h Serious risk of bias. High risk of performance bias (potentially flawed measurement of the exposure; unknown validity of physical activity measure). Reporting bias was an issue in one study (incomplete reporting of data; results are reported narratively).

ⁱ Serious risk of bias. High risk of performance bias (potentially flawed measurement of the exposure; unknown validity of retrospective physical activity measure). Reporting bias was an issue in both studies (incomplete reporting of data; results are reported narratively).

^j Serious risk of bias. High risk of performance bias and other bias (all women who were included in one study were smokers, a risk factor for stillbirth).

^k Two studies reported no cases of stillbirth (not estimable result) and were not included in the pooled analysis.

^l Serious inconsistency. OR values were not estimable in 2 studies.

^m One study included different sub-groups of women. This study was counted only once.

ⁿ Serious risk of bias. High risk of performance bias (potentially flawed measurement of the exposure; unknown validity of physical activity measure). Reporting bias was an issue in one study (incomplete reporting of data; results are reported narratively).

^o Serious risk of bias. High risk of performance bias (potentially flawed measurement of the exposure; unknown validity of prospective and retrospective physical activity measure). Reporting bias was an issue in the study (incomplete reporting of data; additional results are reported narratively).

^p Serious risk of bias. High risk of performance bias (potentially flawed measurement of the exposure; unknown validity of retrospective physical activity measure). Reporting bias was an issue in the study (incomplete reporting of data; results are reported narratively).