

Levels of physical activity during pregnancy: A systematic review

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Introduction

- Physical activity (PA) in healthy pregnant women has a number of benefits¹ (fig. 1).
- In the UK, healthy pregnant women are recommended to engage in 150 minutes of moderate intensity PA spread throughout the week².
- Although guidelines in the UK and worldwide actively encourage PA in pregnant women, it remains unclear how active pregnant women actually are.

Fig. 1: Infographic detailing benefits and recommendations for PA in pregnancy with permission from Smith et. al for reproduction¹



Aims

- To review how physical activity levels change during pregnancy, stratifying these data according to trimester and measurement type (i.e. self-report, device-measured).

Search strategy

- A systematic search was undertaken up to April 2022 across four databases (CINAHL, EMBASE, MEDLINE and PsycInfo).
- The search strategy used MeSH terms and text words capturing the concepts of “physical activity”, “pregnancy” and “levels [of physical activity]”.
- Following title and abstract screening, full texts were obtained. Both reviewers (JB, KH) independently assessed whether studies met the inclusion criteria (fig. 2); any disagreements were resolved by consensus.

Inclusion criteria	
Reported results from a cross-sectional or longitudinal observational study, randomised controlled trial (RCT) or controlled trial (CT)	
At least one measure of PA	
Healthy women with uncomplicated pregnancies	
Exclusion criteria	
Overweight or obese populations	Clinical populations
Non-human studies	Qualitative studies
Medical or obstetric contraindication against PA	

Fig 2: Inclusion and exclusion criteria for study selection

Results

- 166 papers were included for review, totalling 168 individual studies (fig. 3).
- 137 were cross-sectional/longitudinal studies and 31 were interventional studies.
- 62 studies used device-based measures and 124 used self-report measures.
- The majority of studies were conducted in Europe (N=64) or North America (N=61).
- 86 studies looked at PA levels in two or more trimesters, allowing assessment of PA trends. We present these data here.

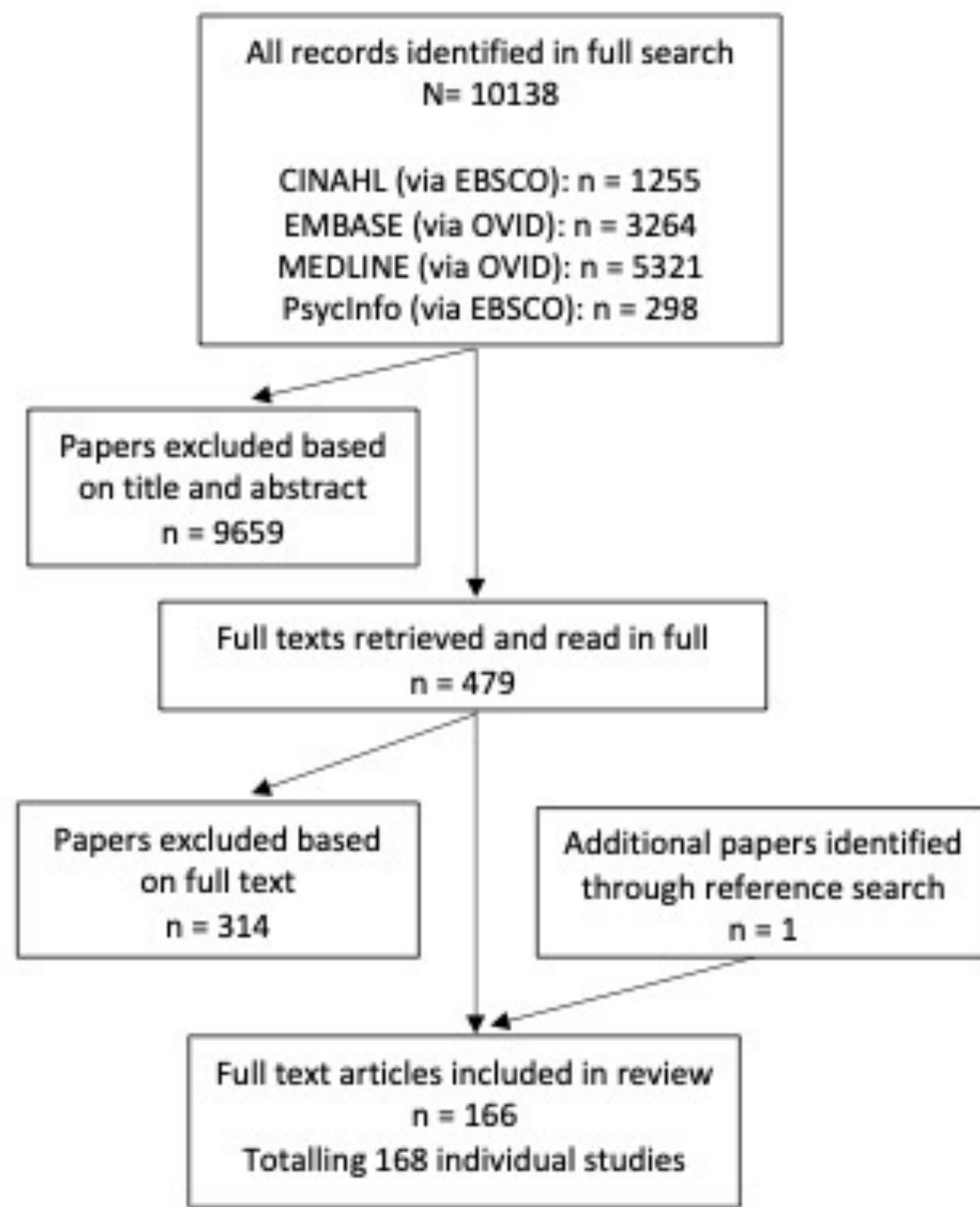


Fig. 3: Flowchart outlining identification of papers for inclusion.

Prospective studies

- Of the studies that measured PA levels across multiple trimesters, most prospective studies (N=36) showed a decrease in PA level across pregnancy. This was true regardless of measure used (fig. 4).

Increasing PA	Decreasing PA	Constant PA	Variable PA
<i>Prospective studies using self-report measures</i>			
6	22	5	11
<i>Prospective studies using device-based measures</i>			
5	14	1	4

Fig. 4: PA trends in prospective studies (N= number of studies)

- Four studies used both self-report and device-based measures. Three studies showed a decrease in PA during pregnancy with both measures^{3,4,5}. In the final study, device-based measures showed an increase in energy expenditure in contrast to a small decrease in reported energy expenditure⁶.

Intervention studies

13 intervention studies used self-report measures.

- Of these, 8 studies showed a decrease in PA in both intervention and control group.
- Four studies showed that intervention groups increased their PA level whereas control groups decreased^{7,8,9,10}.
- One study with no control group also showed an increase in PA over the intervention period¹¹.

Five intervention studies used device-based measures.

- Four showed a decrease in PA, with similar patterns in the three studies using both intervention and control groups.
- One final study showed variable levels in LPA in both intervention and control groups but decreasing levels of MVPA in both groups¹².

Discussion

- Most studies showed a *decrease* in PA during pregnancy. The reasons for this may be that:
 - Women remain unaware of the recommendations and benefits of PA throughout pregnancy.
 - Women feel cautious about PA during pregnancy as they don't know how it will affect themselves or their baby¹³.
 - Women feel limited in the physical activity they can perform as pregnancy progresses (i.e. with a pregnant abdomen).
- Fazzi et al. reported an increase in energy expenditure with a device-based measure but a decrease in self-reported expenditure⁶. Women may report ‘slowing down’ in later pregnancy, with self-report measures reflecting perceptions. Device measures may reflect actual activity expenditure, capturing women working harder as their pregnancy progresses.
- Intervention studies show that it is possible for women to increase PA during pregnancy, with women enrolled in exercise groups, using motivation theory frameworks and attending behaviour change workshop. However, as PA was self-reported, it is possible that women in an intervention group simply reported increased PA, rather than it reflecting a true increase in PA (i.e. reporting bias).

Conclusion

- Despite recommendations for women to remain physically active throughout pregnancy, evidence suggests that women's PA decreases during pregnancy.
- Healthcare professionals and the government should continue to encourage women to remain physically active in pregnancy.
- This could involve educating women about the benefits of PA, providing re-assurance of safety of the foetus and better conceptualising ways to be active during pregnancy.

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