

Journal of Psychiatric Research

Available online 23 September 2024

In Press, Journal Pre-proof  [What's this?](#)



# Interpregnancy Intervals and Behavioural Outcomes in Children: The ALSPAC Study

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## Background – what is known?

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- Interpregnancy interval (IPI) is the duration between the birth of a previous child and the conception of the subsequent child (Ball et al., 2014).
  - A short IPI is commonly defined as less than 18 months (WHO, 2007).
  - It is associated with adverse maternal and perinatal outcomes
    - ✓ intervals of less than 18 months are associated with a modestly increased risk
    - ✓ intervals of less than 6 months are associated with a greater risk
- Xu et al., 2022,  
Conde-Agudelo et al., 2006
- The ACOG recommends
    - advising women to avoid IPIs shorter than 6 months and
    - counselling about the risks and benefits of repeat pregnancy within 18 months (ACOG, 2019).
  - WHO also recommends waiting at least 24 months following a live birth to reduce the risk of adverse maternal, perinatal and infant outcomes.
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# Gaps and Objectives

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## Gaps

- The long-term mental health impact of short IPI has not been well investigated.
- Few studies have examined the link between IPIs and neurodevelopmental disorders in Children ([Class et al., 2018](#); [Conde-Agudelo et al., 2016](#)).
- No studies have examined the association between IPIs and behavioural problems in children.

## Objectives

- The study investigated the associations between short IPIs and behavioural outcomes in children between ages 7 and 16.

# Methods

## Data source and study participants

### Data source

- Avon Longitudinal Study of Parents and Children (ALSPAC), Bristol, UK
- An ongoing large population-based longitudinal birth cohort

### Participants

- **Sample**-over 2300 mothers and their children were included
- **Time points**- four developmental periods (7, 9, 11 and 16)

## Measurements and statistical analyses

### Exposure

- Assessed at the time recruitment ~at 18 weeks' gestation.
- Categorised as <6, 6–11, 12–17, 18–23, 24–35, ≥36 months.

### Outcome

- Strengths and Difficulties Questionnaire (SDQ)
- The tool comprises 25 questions, with five sub-scales (each containing five items)

### Analyses

- GEE-overtime
- Logistic regression-at each time point

# Results

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- The mean (SD) age of mothers was 29.7 ( $\pm 4.2$ ) years
  - 15.1% of mothers smoked tobacco
  - 17.0% consumed alcohol
  - 17% had antenatal depressive symptoms
  - 13.1 % had pregnancy hypertension
  - 12.3% children were born after short (< 6 months) IPIs.
- 9.9% and 7.6% of children had total behavioural difficulties at the ages of 7 and 16, respectively.
  - Overall, more boys than girls had total behavioural difficulties.
  - Compared to participants with long IPIs, those with short IPIs were more likely to be
    - younger
    - married
    - educated
    - non-smokers
    - had few children
    - pregnancy HPN
- } P <.05

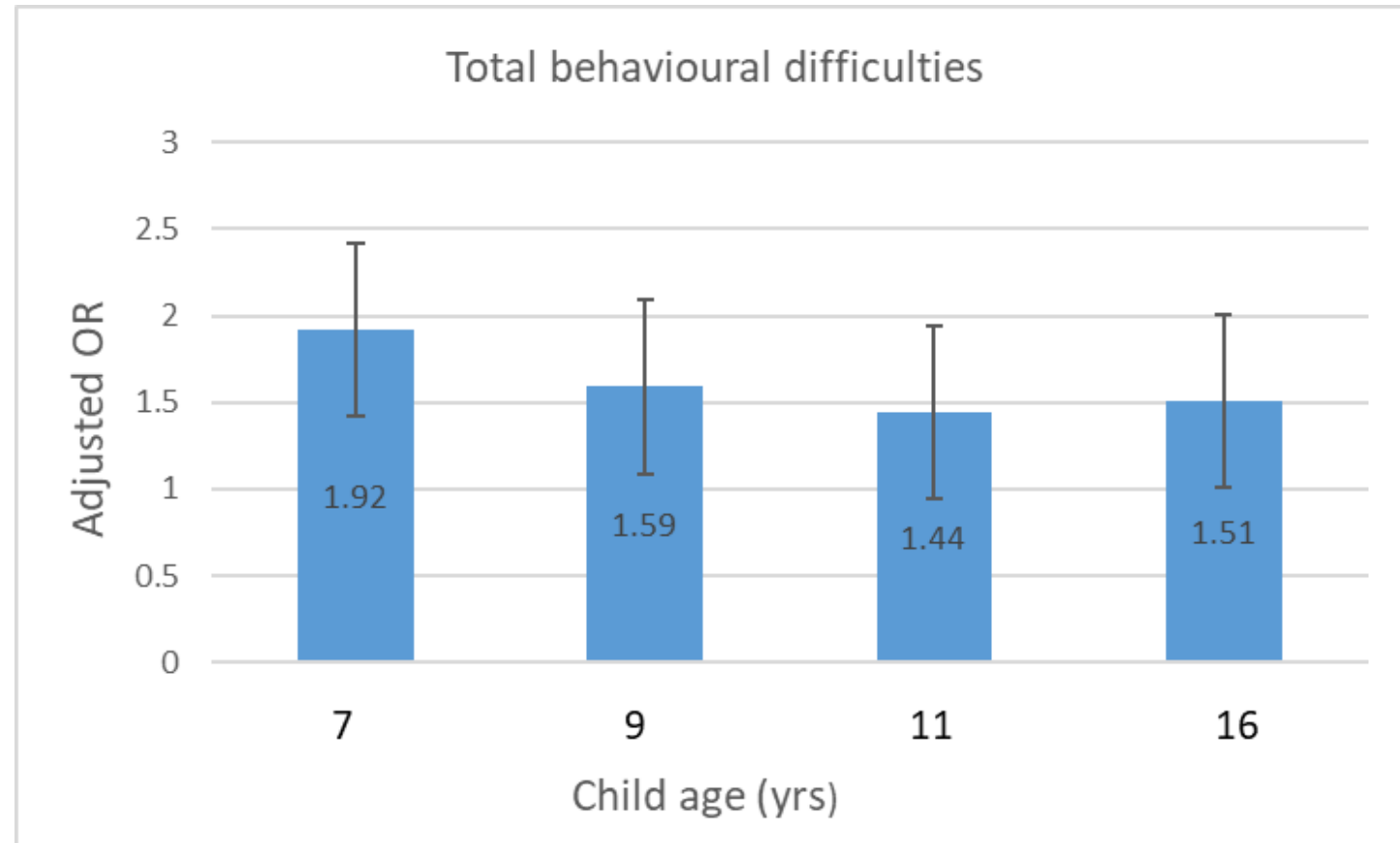
Table 1. The association between IPI and emotional and behavioural problems across ages (GEE model)

IPIs	AOR (95%CI)#				
	Total behavioural difficulties	Hyperactivity/ inattention problems	Conduct problems	Emotional symptoms	Peer-relationship problems
<6 moths	1.54(1.12-2.11)	1.37(1.04-1.79)	1.42(1.12-1.81)	1.15(0.88-1.50)	1.22(0.94-1.58)
6-11 months	1.25(0.92-1.70)	1.17(0.90-1.52)	1.22(0.96-1.53)	1.03(0.80-1.33)	1.10(0.85-1.41)
12-17 months	1.22(0.91-1.65)	1.06(0.82-1.36)	1.14(0.89-1.40)	0.95(0.74-1.22)	1.19(0.93-1.51)
18-23 months	1	1	1	1	1
24-35 months	0.96(0.71-1.30)	1.00(0.78-1.28)	1.16(0.93-1.45)	0.96(0.75-1.22)	1.02(0.80-1.30)
>36 months	1.30(0.97-1.74)	1.23(0.97-1.58)	1.35(1.09-1.68)	0.98(0.77-1.25)	1.24(0.98-1.57)

# Adjusted for maternal and paternal age, maternal marital status, maternal education, parity, alcohol drinking during pregnancy, maternal smoking in pregnancy, pregnancy diabetes status, UIT during pregnancy, maternal hypertensive disorders during pregnancy, maternal antenatal anxiety and depressive symptoms and child gender.

- We noted U-shaped relation between IPI and behavioural problems in children, with increased risk for both short- and long intervals.
- We observed comparable results when we reran the models using the continuous SDQ scores.

Fig 1. IPI of < 6 months and total behavioural difficulties in children.



# Conclusions

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Short IPI was associated with externalising (conduct and hyperactivity/inattention) problems.

We found no evidence of association between Short IPIs and internalising (emotional and peer-relationship) problems.

Further studies are needed to confirm this association and elucidate the underlying mechanisms.



# Acknowledgments



Avon Longitudinal Study of Parents and Children



Curtin University

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