A meta-analysis of the effects of overweight and obesity on endometrial cancer

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Introduction

- Endometrial cancer is
  - The 7th most common cancer in women worldwide
  - The most common gynecological malignancy in developed countries
- Its incidence has been increasing over the last decades

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Introduction

- Some well-known risk factors for uterine cancer are:
  - Age
  - Early menarche
  - Late menopause
  - Using estrogen hormone without progesterone
  - Diabetes

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Introduction

- To date, several epidemiological studies have investigated the association between body mass index (BMI) and endometrial cancer.
- However, the results are inconsistent.

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Objective

- This meta-analysis was conducted to estimate the overall effect of excess BMI on endometrial cancer based on current evidence.

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Methods

- We searched major electronic databases including:
  - PubMed
  - Web of Science
  - Scopus
- Until march 2015

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Methods

- We also searched
  - The reference lists of the included studies
  - The related scientific conference databases as follows:
    - American Cancer Society; available from: www.cancer.org
    - International Agency for Research on Cancer; available from: www.iarc.fr
    - American Society of Clinical Oncology; available from: www.asco.or

Methods

- We developed a search strategy using and combing a set of keywords including
  - (Cancer OR Malignancy OR Carcinoma OR Tumor)
  - AND
  - (Body mass index OR BMI OR Body size OR Obese OR Obesity OR Overweight)
  - AND
  - (Endometrial OR Uterine OR uterus)

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Methods

- Epidemiological studies addressing the association between BMI and endometrial cancer were included
  - Cohort studies
  - Case-control studies
- The exposure of interest was excess BMI
  - Overweight (BMI: 25-29.9 k/m^2)
  - Obesity (BMI: ≥30 kg/m^2)

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Methods

- The outcome of interest was
  - Endometrial cancer of any type confirmed pathologically
  - Type I: endometrioid adenocarcinomas (80%)
  - Type II: clear cell adenocarcinomas

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Methods

- The effect measure of choice was
  - Rate ratio (RR) for cohort studies
  - Odds ratio (OR) for case-control studies
- The random effect model was reported for the both estimates

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Methods

- Heterogeneity among studies was assessed using
  - Q-test
  - I^2 statistic
- Publication bias was assessed using
  - Funnel plot
  - Begg's test
  - Egger's test

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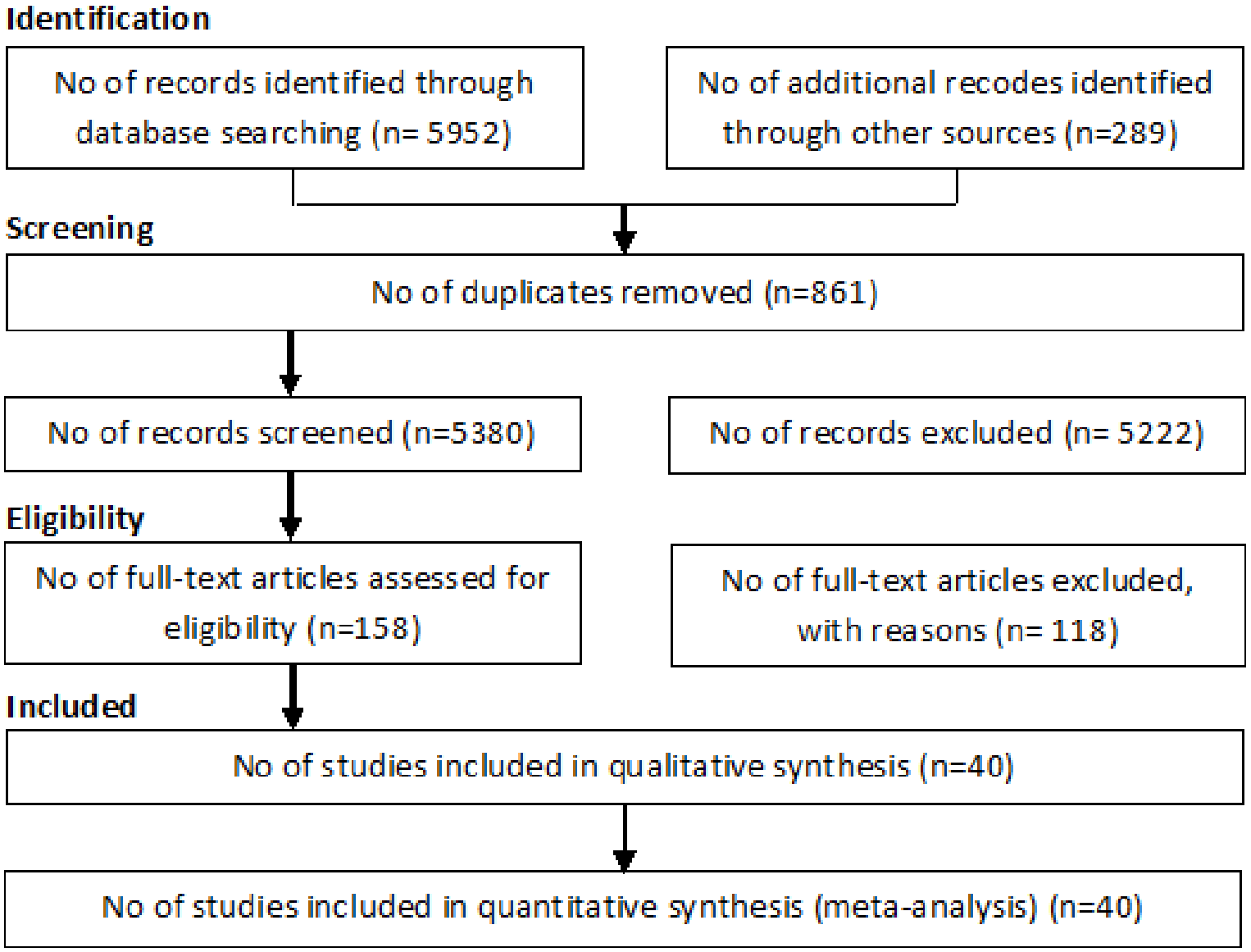
Results



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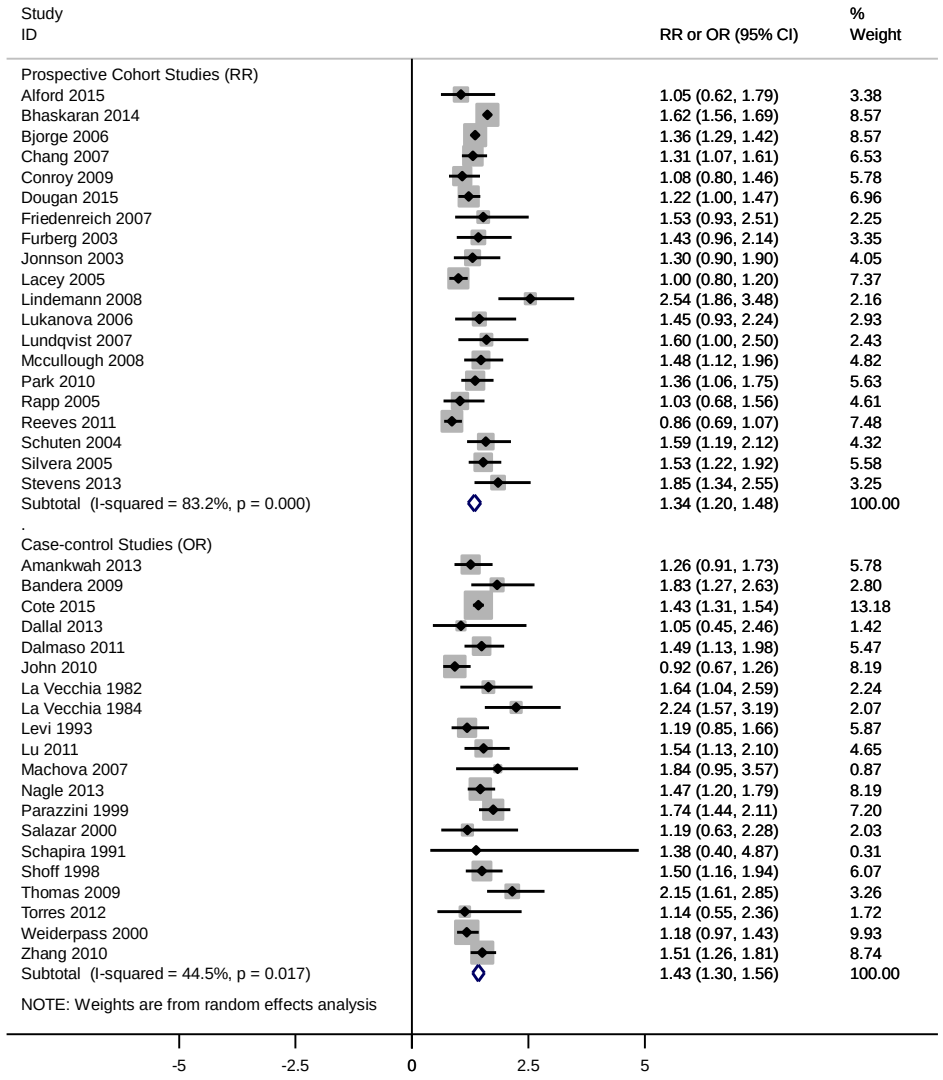
Results

- **Overweight**
- Prospective cohort studies
  - RR: 1.34 (1.20, 1.48)
  - I^2 : 83.2%
  - Q-test: 0.001
- Case-control studies
  - OR: 1.43 (1.30, 1.56)
  - I^2 : 44.5%
  - Q-test: 0.017



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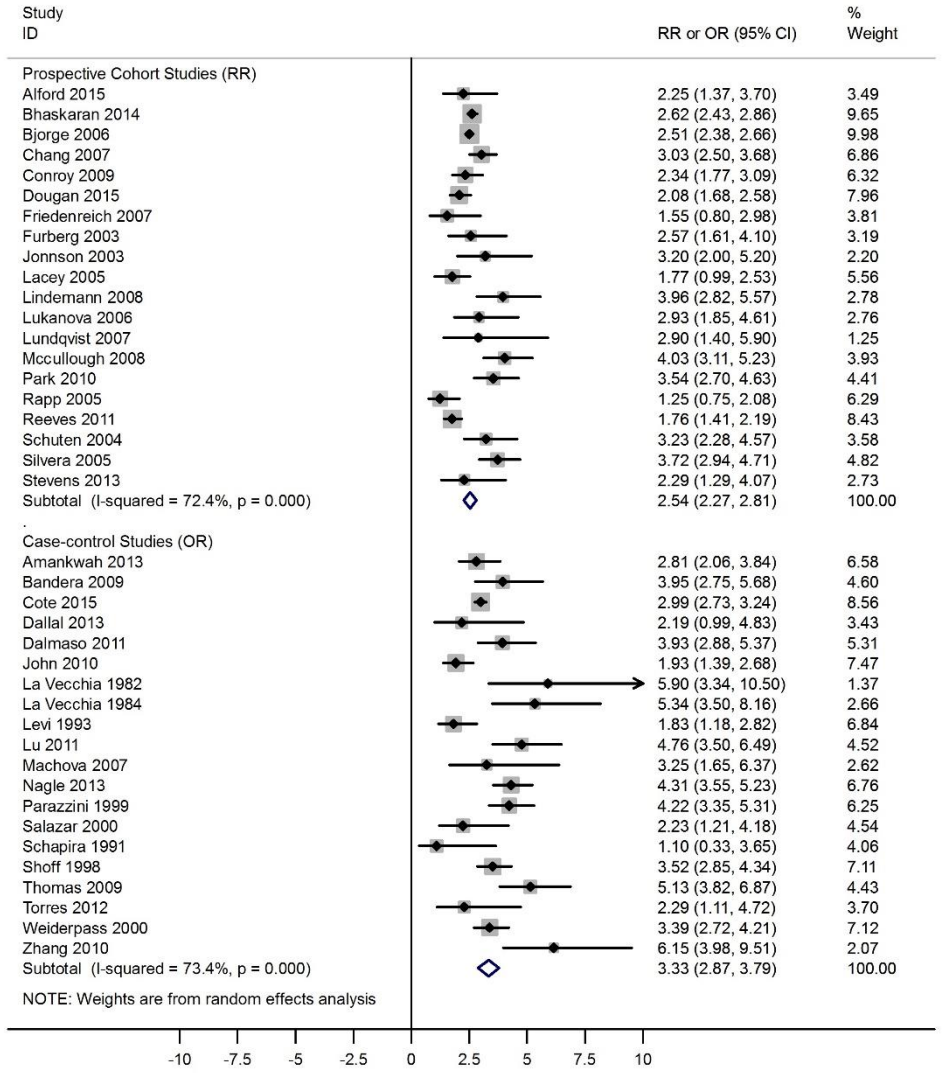
Results

- **Obesity**
- Prospective cohort studies
  - RR: 2.54 (2.27, 2.81)
  - I^2 : 72.4%
  - Q-test: 0.001
- Case-control studies
  - OR: 3.33 (2.87, 3.79)
  - I^2 : 73.4%
  - Q-test: 0.001



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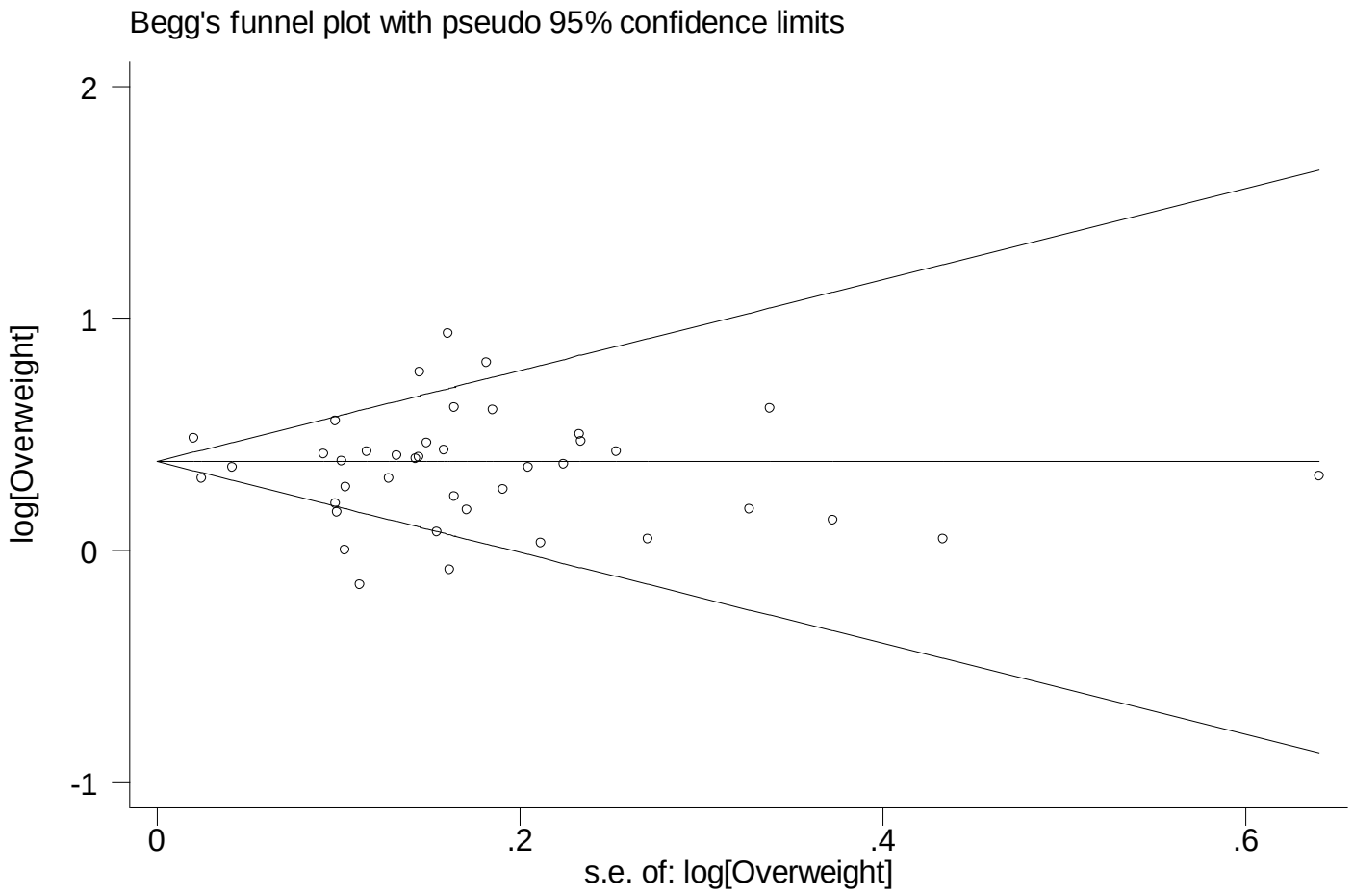
Results

- **Publication bias**
- Begg’s test
  - P=0.641
- Egger's test
  - P=0.253



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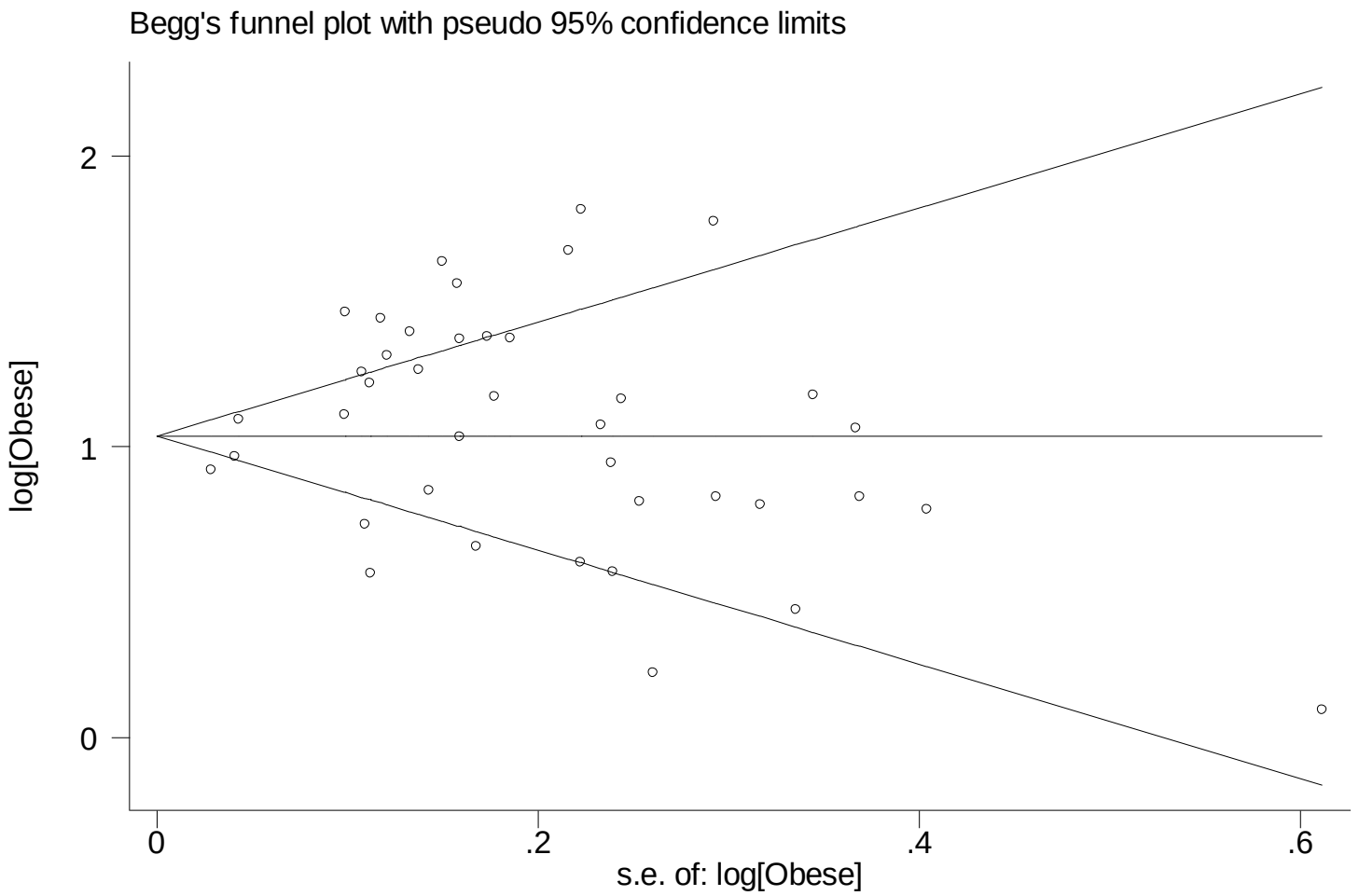
Results

- **Publication bias**
- Begg’s test
  - P=0.192
- Egger's test
  - P=0.160



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Limitations

- We used the adjusted forms of RR and OR wherever reported. However, some studies reported the crude forms of RR and OR. This issue may raise the possibility of the information bias in our results.
- In some studies weight and height were self-reported while overweight and obese women are more likely to underreport their weight and those who are underweight are more likely to overreport their weight. This might introduce information bias into the results of the studies included in this meta-analysis.

Strengths

- Despite its limitations, we developed a wide search strategy in order to increase the sensitivity of the search to include as many studies as possible.
- This meta-analysis included all types of observational studies irrespective of age, country, race, publication date, and language.
- We screened 6241 retrieved references and included 40 eligible studies involving 32,281,242 participants.
- Therefore, the evidence is sufficient to make a robust conclusion regarding the objective of the study for estimating the association between BMI and endometrial cancer.

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Conclusion

- The results of this meta-analysis indicated that BMI is strongly associated with an increased risk of endometrial cancer.
- Further investigations are required to assess the pathophysiology through which excess BMI may increase the risk of endometrial cancer.

Acceptance

- This meta-analysis is accepted for publication in:
  - Public Health (Elsevier)
  - IF: 1.434

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Thank you

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