

Acute Kidney Injury (AKI) in pregnancy is associated with adverse maternal and foetal pregnancy outcomes. There is some evidence that is associated with adverse cardiovascular and renal outcomes such as need for dialysis. However, the literature is still limited. Furthermore, there is no standardised definition for AKI in pregnancy nor are any existing criteria validated for use in pregnancy.

Aim: To quantify the risk of adverse cardio-renal outcomes of AKI in pregnancy.

Methods: A literature search was conducted on MEDLINE, Cochrane Library and EMBASE from inception until October 2022. Studies were only included if they compared pregnant women with AKI to pregnant women without AKI and included specified renal or cardiovascular outcomes. All studies were screened and data collection was performed by two independent reviewers. Any discrepancy was addressed by a third reviewer. Analysis was performed using RevMan 5. Subgroup analysis was performed based on the presence of preeclampsia.

- Results**
- 17 studies were included following the screening process in Figure 1.
 - A total of 92, 509, 011 pregnant women were included in this study. Of the total, 69, 191 pregnant women had AKI (0.074%) of which 853 women had pre-eclampsia (1.23%).
 - The cardiovascular and renal outcomes are shown in Table 1. The subgroup analysis based on the presence of preeclampsia is shown in Table 2.
 - There is significant heterogeneity in the majority of outcomes investigated. Furthermore, variability in the AKI definition amongst included studies makes meta-analysis more challenging.

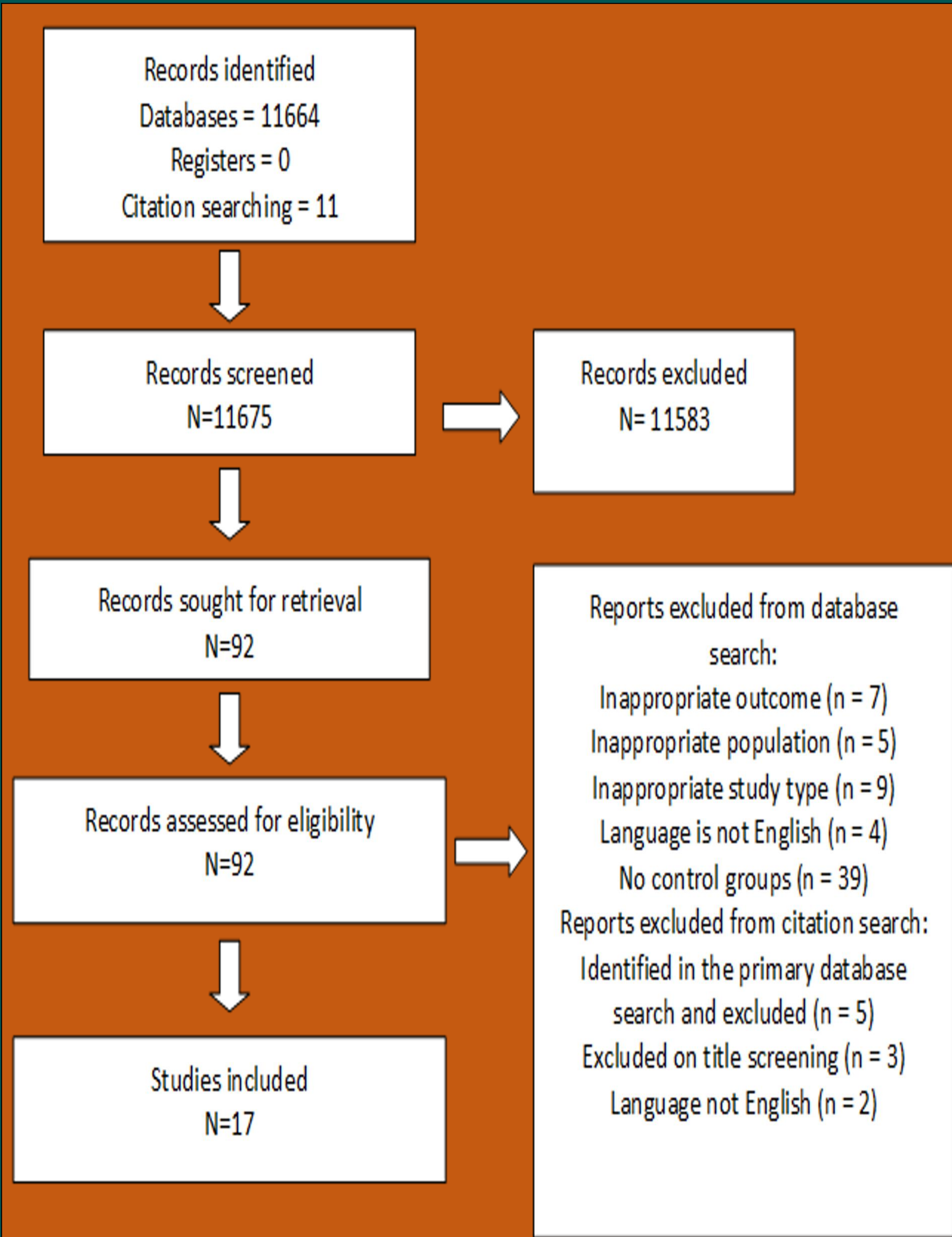


Figure 1 – Flow chart

Outcomes	OR [95% CI]
Maternal mortality	9.70 [3.49–26.97]
Hypertension	1.22 [0.44–3.40]
ICU admission	3.86 [1.93-7.71]
Heart failure	22.55 [4.39-115.71]
Stroke	22.92 [2.32-226.65]
Thrombotic microangiopathy	9.62 [1.61-57.67]
Partial renal recovery or renal insufficiency	38.07 [10.29-140.82]
Dialysis	408.99 [1.23-135716.4]
Composite cardiovascular diseases (myocardial infarction, heart failure, stroke, and peripheral vascular disease)	28.26 [20.24-39.46]
Composite renal outcome (chronic kidney disease, end-stage renal disease or renal replacement therapy)	52.37 [4.67-587.63]

Table 1 - Summary of outcomes

Outcomes	Preeclampsia OR [95% CI]	Non-preeclampsia group (OR [95% CI])
Maternal mortality	5.63 [3.45, 9.18]	17.71 [3.14, 99.95]
Hypertension	0.90 [0.49, 1.66]	1.33[0.25, 6.95]
ICU admission	2.73 [2.07, 3.60]	6.03 [4.62, 7.86]
Stroke	8.87 [1.51, 52.27]	91.92 [81.65, 103.49]
Thrombotic Microangiopathy	6.87 [3.25, 14.51]	11.21 [0.69, 182.29]
Dialysis	38.22 [7.13, 204.80]	13958.45 [0.00, 6.742E10]
Composite renal outcome	12.83 [3.35, 29.13]	549.42 [0.93, 326294.95]
Composite cardiovascular diseases	7.14 [3.35, 14.22]	33.31 [23.44, 47.35]

Table 2 – Summary of subgroup analysis based on the presence of pre-eclampsia

- Discussion**
- Our systematic review largely supports the existing literature.
 - The main strength of our study is the sensitivity analysis by AKI definition and subgroup analysis by the existence of pre-eclampsia.
 - The outcomes are compiled using follow-up data over at least 1 year or more and reflect long-term outcomes.
 - The review is comprehensive and has a large sample size drawn from a multinational cohort.
 - Limitations include publication bias, small sample size of AKI patients and confounding factors not adjusted for in the studies.
 - Future research should consider standardisation of AKI definition and measurement in pregnancy.
 - There is an urgent need for high-quality primary studies.
 - Due to limited options for assessing renal function in pregnancy, there is a need to develop new ways or alter existing ways to assess renal function.

References

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