

# The association between polypharmacy and its adverse health outcomes in adult patients with type 2 diabetes mellitus: A systematic review and meta-analysis

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## Background

- Type 2 diabetes mellitus (T2DM) remains a significant chronic disease for adults. **Nowadays more adults have been diagnosed with T2DM and classified as early-onset patients.**
- The age-standardized global T2DM prevalence rate was 5,282 per 100,000 population, with a projected increase to 9.5% by 2050, impacting over 1.27 billion individuals.
- The issue of polypharmacy has garnered increasing attention due to the simultaneous development of new drugs and extended life expectancy.

## Objective

- To present a **summary of the research literature** on polypharmacy and its association with adverse health outcomes in adult T2DM patients.

## Methods

- A **systematic review was conducted across three databases** (PubMed, Web of Science, and ScienceDirect) through October 2023.
- Studies regarding the relationship between polypharmacy and diabetes-related health outcomes, complications as well as multi-morbidity were included.
- A **fixed effects model was applied in the calculation of pooled odds ratios (ORs) and 95% confidence intervals (CIs)**.  $I^2$  statistics was deployed for assessing heterogeneity.

## Results

- Among 24 studies that met the inclusion criteria, three were included in the meta-analysis.
- The association between polypharmacy and poor glycemic control was found to be statistically significant** (OR=1.84, 95% CI [1.68-2.01],  $P < 0.00001$ ,  $I^2 = 0\%$ ).
- Polypharmacy (the daily/concurrent use of  $\geq 5$  medications or the use of  $\geq 1$  oral antidiabetics/oral antidiabetics combined with insulin) was found to be significantly associated with an 84% higher risk of poor glycemic control in T2DM adult patients.
- Included studies also reported the association between polypharmacy and **hospitalization, death, hypoglycemia, complications (diabetic foot ulcers, non-proliferative diabetic retinopathy), and multi-morbidity (fracture, falls, depression relapse, health-related quality of life)**.
- Only insignificant association between stroke and polypharmacy (combined  $\geq 2$  types of antidiabetic medications) was reported.

Figure 1: The PRISMA flow diagram for the included studies

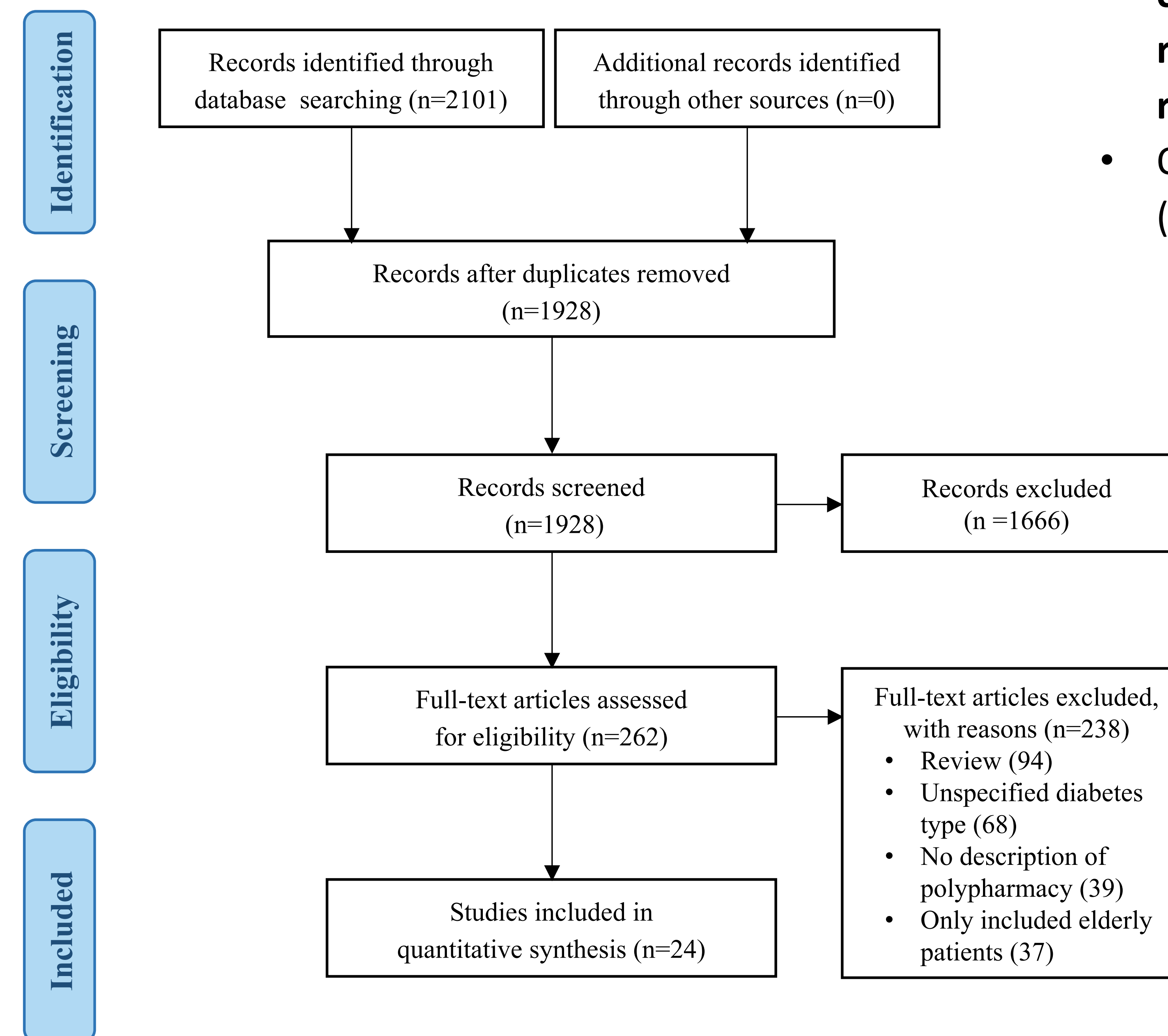
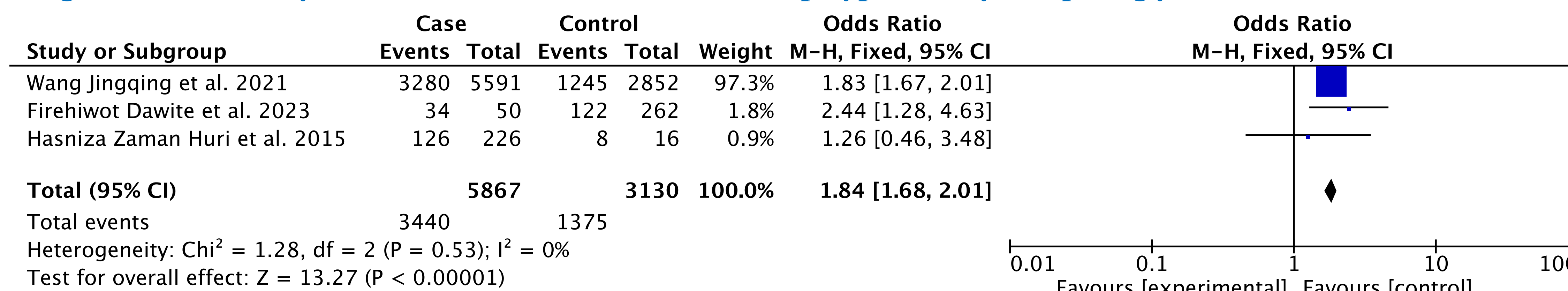


Figure 2: Meta-analysis of studies on association between polypharmacy and poor glycemic control



## Discussion

- The limitations of this meta-analysis revolve around **the definition of polypharmacy and the reporting of diabetic complications and comorbid conditions.**

## Conclusion

- The current research has revealed a significant association between polypharmacy and several adverse health outcomes in adults with T2DM.
- The evidence underscores the need for **greater caution and improved management in drug therapies** to mitigate these risks.

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