

“Real world” evidence does not support the use of methylphenidate to improve academic achievement of ADHD students

The Problem

- **Attention deficit hyperactivity disorder (ADHD)** symptoms usually impair academic achievement, and it motivates the start of ADHD medication.
- **Methylphenidate** is the drug most commonly prescribed, however, systematic reviews of randomized clinical trials suggested that it does not lead to relevant improvements on academic accuracy.
- As **academic achievement** is a complex outcome, it is relevant to investigate it in non-randomized studies because they can demonstrate the impact of the medication use in reality.

Methods

- **Systematic review of observational studies** - Protocol registration: PROSPERO CRD42016038140
- Searches: databases MEDLINE, EMBASE, LILACS, Psyc Info, ERIC, gray literature databases and manual searches.
- Inclusion criteria:
 - Observational studies: methylphenidate vs. no treatment or other pharmacological/nonpharmacological alternatives used in ADHD.
 - Main outcome: academic achievement
 - Setting: school environment
- Risk of bias: adapted versions of the Newcastle-Ottawa Scale (NOS) - Maximum stars that can be awarded for each type of study:
 - Cohort: 9
 - Before-and-after design: 7
 - Cross-sectional: 6

Key Results

- Eight studies (from nine reports) were included in the review. They involved 11268 children and adolescents aged 6 to 18 years and no adults. The doses of methylphenidate ranged from 10 to 72 mg/day and the duration of the treatment from 2.6 months to 4.25 years.
- The included studies have considerable limitations and great heterogeneity regarding methodological design and academic performance measurement criteria.

Although there are studies indicating that short-term use of methylphenidate may improve outcomes in the school environment, the available scientific literature does not support the establishment of adequate conclusions about the real benefits of methylphenidate in the academic improvement of ADHD students.

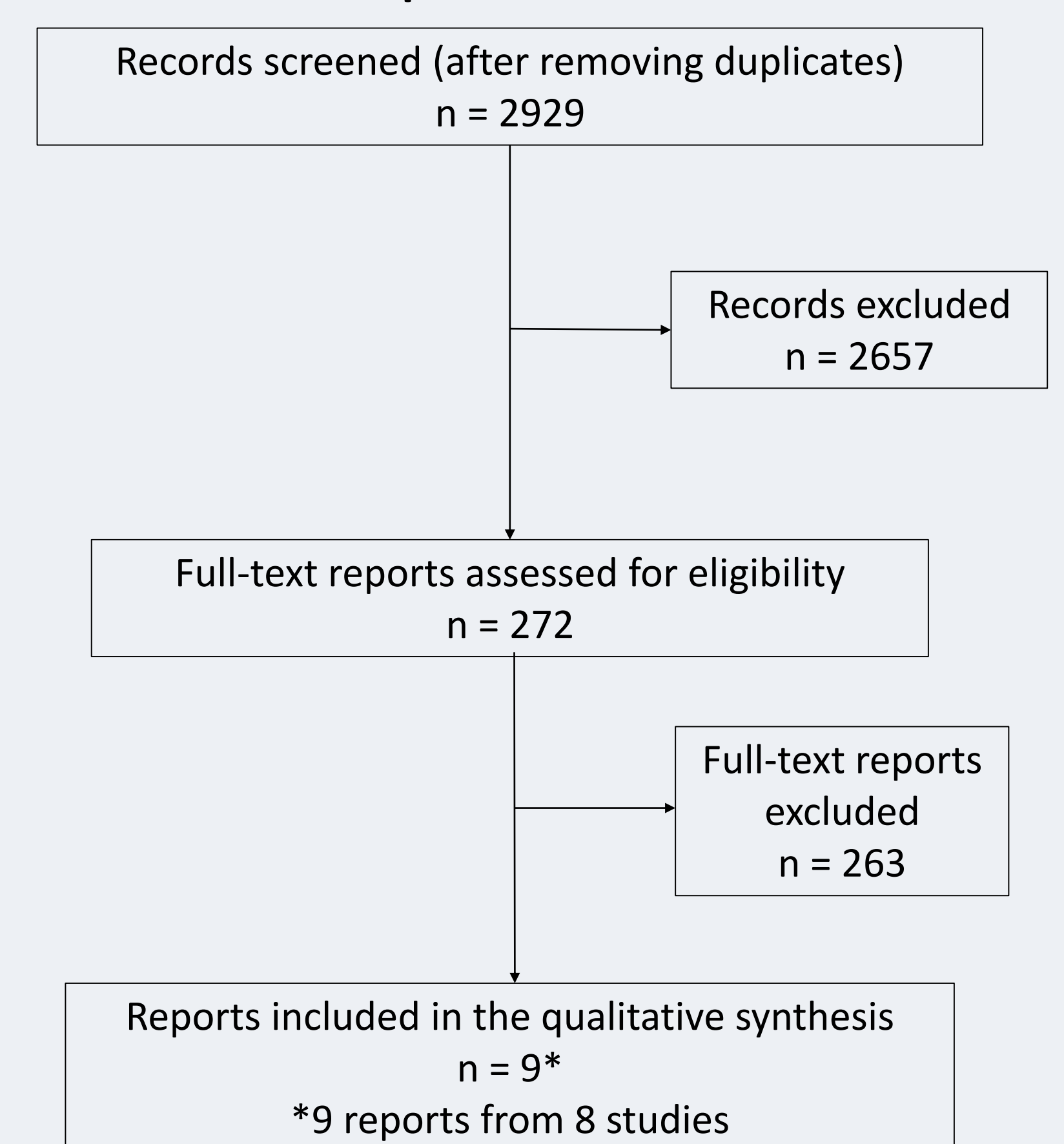
Methylphenidate use to improve academic achievement of Attention Deficit Hyperactivity Disorder (ADHD) diagnosed students – a systematic review of observational studies



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Summary PRISMA flow diagram of the selection process



Main results - studies ranked according to the NOS assessment

Author, year Study design / Total sample size	Evaluation of the long term use of methylphenidate (> 1 year)	Conclusion: is methylphenidate effective in improving academic achievement?	NOS
Alto & Frankenger, 1995 / Frankenger & Cannon, 1999 Cohort / n = 34	Yes	No	8*
Weiss, 1975 Cohort / n = 66	Yes	No	7*
Bezerra, 2014 Cohort / n = 57	No	Yes	6*
De Zeeuw et al., 2017 Cross-sectional / N = 10902	No	Yes	5*
Charles & Schain, 1981 Cross-sectional / n = 62	Yes	No	5*
Gökçen & Güleç, 2012 Before-and-after / n = 35	No	Yes	4*
Niederkirchner et al., 2011 Before-and-after / n = 42	No	Yes	4*
Ercan et al., 2012 Cross-sectional / n = 60	Yes	Yes	4*

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