

Oculomotor rehabilitation in concussion/mild traumatic brain injury: A systematic review

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Background

- Up to 85% of people with a concussion/mild traumatic brain injury (mTBI) experience persistent symptoms related to oculomotor dysfunction
- The efficacy of oculomotor-based interventions for adults with concussion/mTBI, and any sex/gender-based differences in response to these interventions, are currently unknown



Sex refers to **biological attributes** of humans; gender refers to **socially constructed roles, responsibilities, identities and behaviors** of men, women, and gender-diverse people

Objectives

This systematic review aimed to:

- Synthesize and critically appraise** evidence on the efficacy of oculomotor-based interventions in adults with concussion/mTBI
- Apply a sex and gender lens** to analyses / reporting
- Identify direction for **future research**

Methods

Table 1: Study Selection via PICOS framework

Population	Adults recovering from concussion/mTBI
Intervention	Oculomotor-based, non-pharmacological
Comparator	Any comparator, placebo, no treatment
Outcome	Oculomotor metrics, (adverse events- no report)
Study Design	Experimental study

Registration PROSPERO: CRD42022352276

Results (preliminary)

Figure 1 shows steps taken in the research process

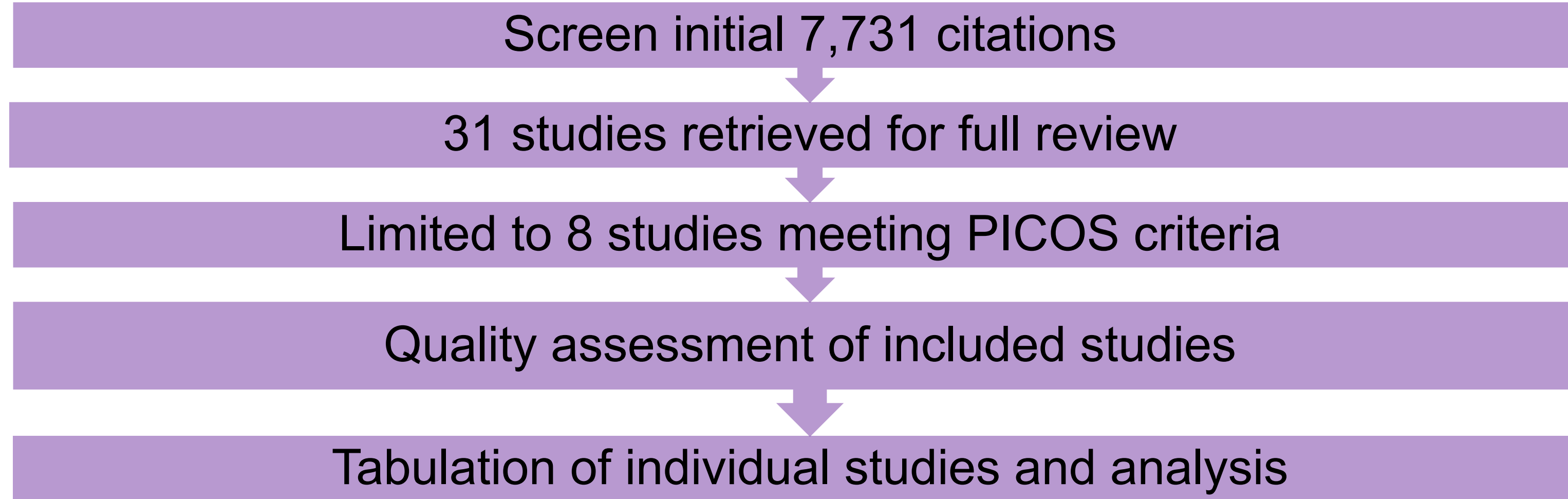


Figure 2 shows Risk of Bias across all studies (% studies per domain)

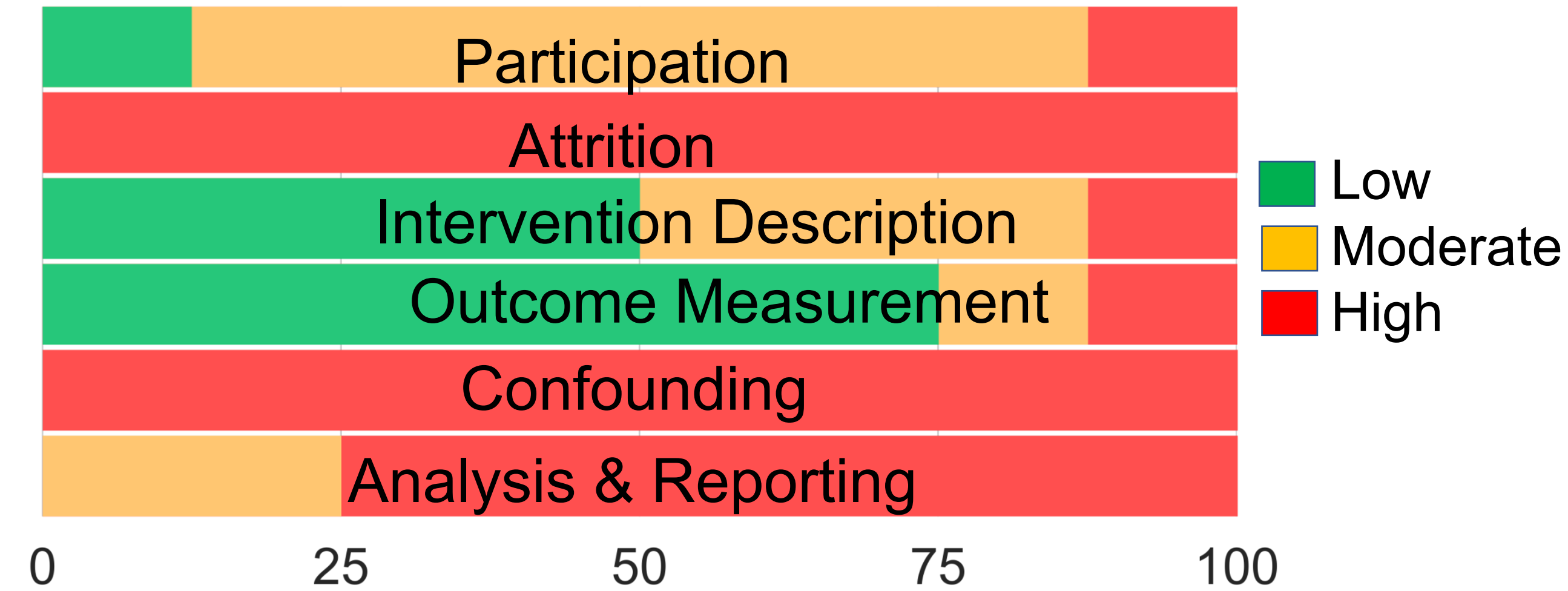


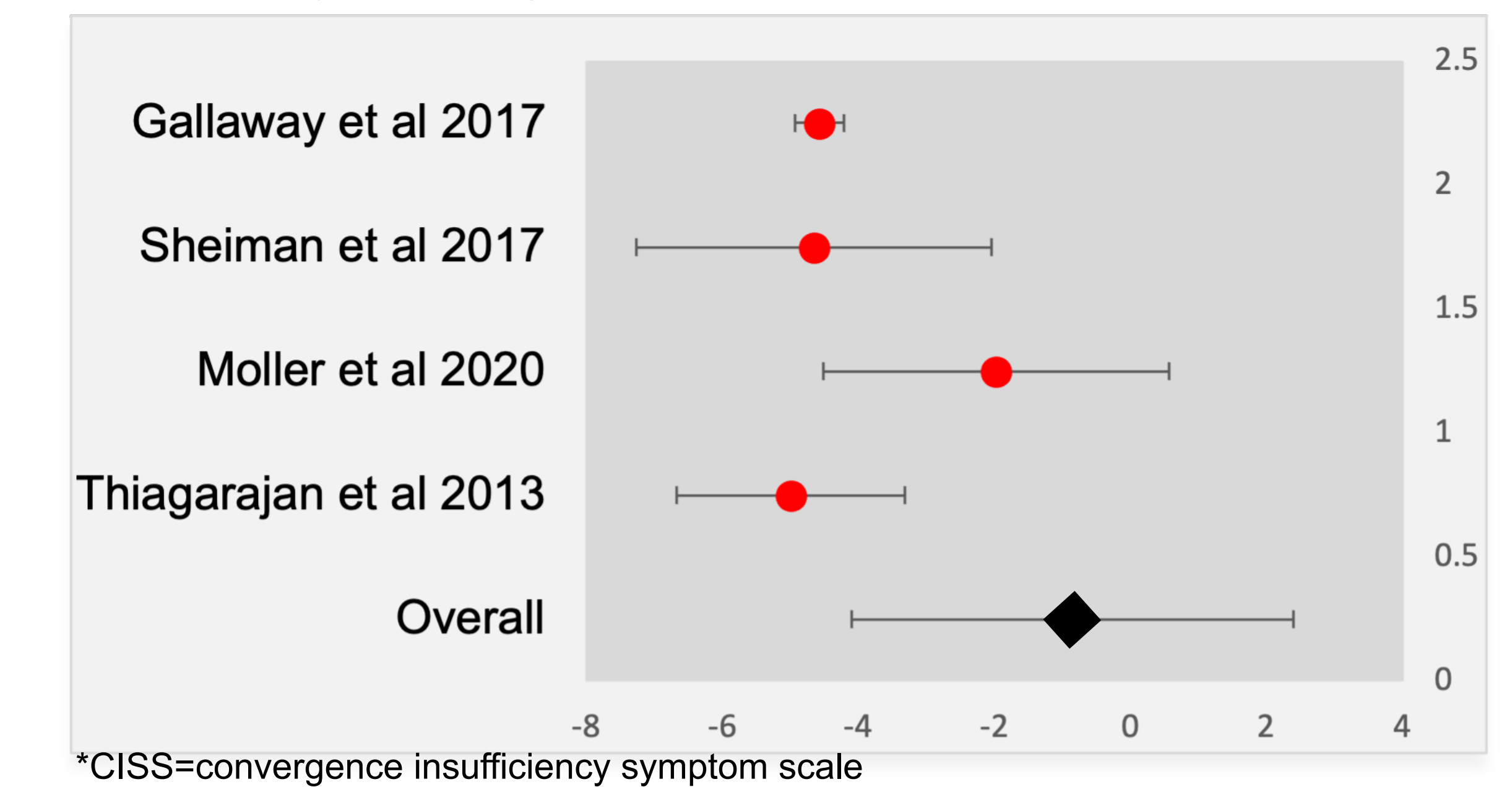
Table 2 shows selected results, variance in outcome assessed

Variable \ Study	1	2	3	4	5	6	7	8
Days (per wk)	varied	1	1	1	1	2	2	2
Time (mins/day)	varied	60	40	60	60	45	45	45
Duration (wks)	varied	3-6	4.5	13.6	10	6	6	6
NPC (cm)	↑	↑	-	↑	-	↑	↑	-
RR (wpm)	-	-	-	-	↑	↑	↑	-
VSAT (score)	-	-	-	-	-	↑	-	↑

*mins=minutes; NPC=near point convergence; RR=reading rate; VSAT=visual search and attention; wks=weeks; wpm=words per minute

Results (continued)

- Study design: 7 case series, 1 crossover design
 - Various measures of outcome
 - Total number: 418 (range 3 to 218; 43% male; mean age 25)
- Figure 3 displays change in CISS* score in response to intervention



Sex and gender analysis: Zero studies performed sex- or gender-based analysis when reporting results.

Conclusions

- There exists a trend suggesting a benefit of oculomotor-based interventions** in persons with concussion/mTBI however their utility versus standard care **remains unknown**
- The influence of sex and gender remains a giant gap that must be explored**
- Future directions:** A randomized controlled trial is required to determine if (1) oculomotor-based rehabilitation is more effective than usual care and (2) early intervention improves outcomes

REFERENCES: 1. Gallaway et al (2017), 2. Moller et al.(2020), 3. Scheiman et al.(2017), 4. Smaakjaer et al (2022), 5. Peters et al.(2017), 6. Thiagarajan et al.(2013), 7. Thiagarajan et al (2015), 8. Yadav et al (2014)