

# Prevalence of Torticollis and Plagiocephaly in Children Later Diagnosed with Autism: A Scoping Review

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## Background

- Torticollis and plagiocephaly are common musculoskeletal conditions in infancy with reported incidence rates of 0.3-2% and 15-20% respectively.<sup>1,2</sup>
- Torticollis and plagiocephaly are associated with abnormal gross motor and postural control development impacting overall neurodevelopment.
- Autism is a neurodevelopmental condition characterized by differences in social communication and restricted or repetitive behaviors.<sup>3</sup> Recent associations have been identified between abnormal early motor development and a later autism diagnosis.<sup>4</sup>
- The gross motor developmental differences seen in children with torticollis and plagiocephaly share clinical features with the atypical motor development seen in autism.

## Methods

- Search terms were identified with library scientist counsel.
- Five databases were searched for articles examining torticollis and/or plagiocephaly in children later diagnosed with autism.
- Articles were managed using Covidence Systematic Review Management Software<sup>8</sup>.
- Two independent reviewers screened title/abstracts and full text articles for inclusion with a third reviewer resolving all conflicts.
- Inclusion criteria included studies reporting prevalence, incidence, or frequency of torticollis and/or plagiocephaly among children with a confirmed autism diagnosis.
- Exclusion criteria included cranial asymmetry attributed to causes other than positional plagiocephaly or congenital muscular torticollis, case reports with less than five participants, gray literature, conference abstracts, review articles, editorial, and studies not published in English.
- Data was extracted using a template based on the Joanna Briggs Institute extraction template.

## Results

Figure 1.

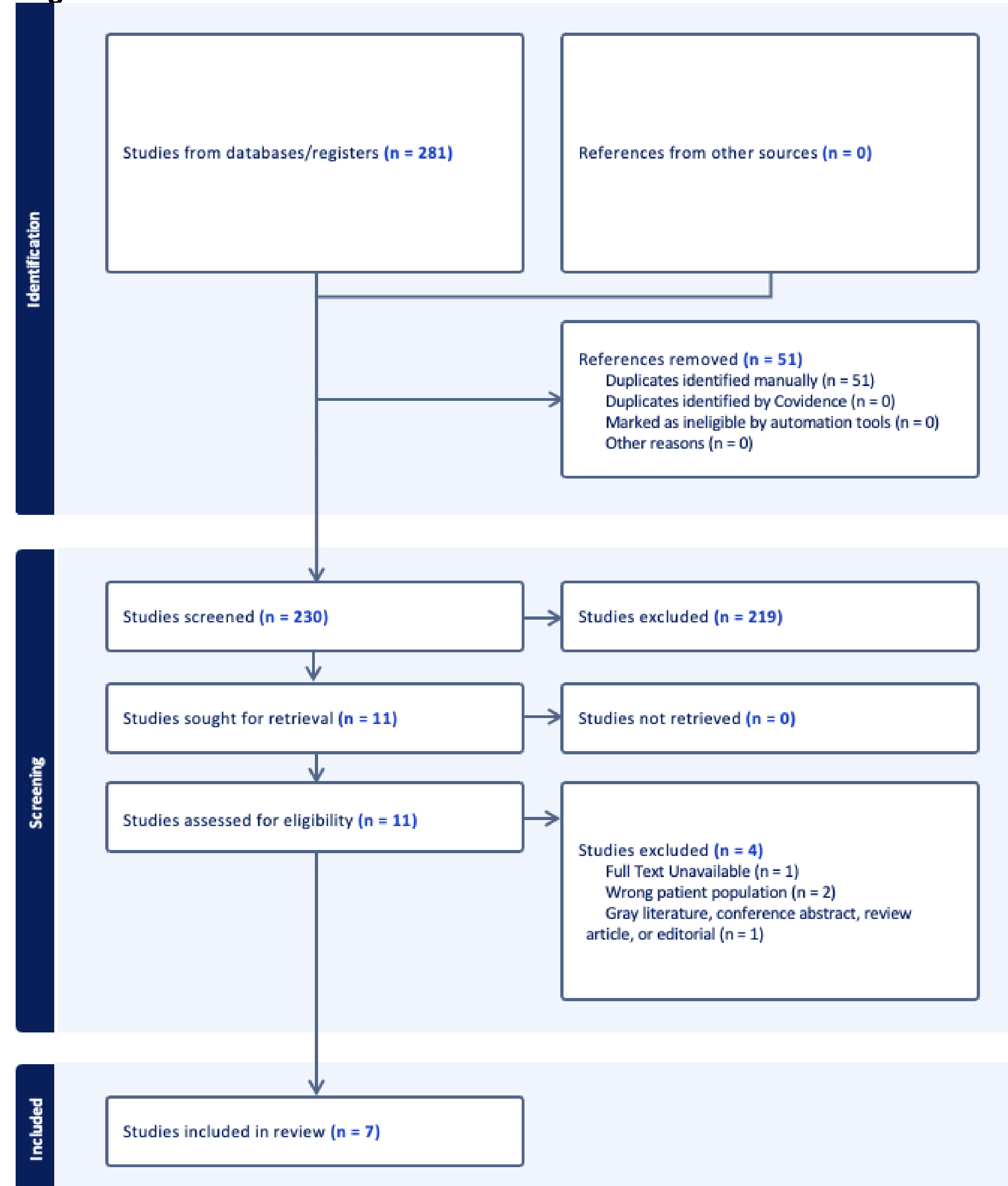


Figure 3.

	Reported Prevalence Data
<b>Torticollis</b>	
Kochav-Lev et al., 2023	19.52% of the autistic group had a torticollis diagnosis. <sup>15</sup>
Schertz et al., 2013	32-44% of children with a history of torticollis had a developmental disorder, including autism. <sup>10</sup>
<b>Plagiocephaly</b>	
Ambrosino et al., 2022	1.7% of children in the autistic group had plagiocephaly. <sup>9</sup>
Lynch et al., 2024	2.2% of children with plagiocephaly later diagnosed with autism. <sup>11</sup>
Di Renzo et al., 2022	48% of autistic children had plagiocephaly. <sup>13</sup>
Gurevitz et al., 2023	Equal rates of PT referrals for autistic and typically developing group. <sup>12</sup>
<b>Combined Torticollis and Plagiocephaly</b>	
Burns et al., 2023	5.94% of autistic children had torticollis and/or plagiocephaly. <sup>14</sup>

### Reported Prevalence Data (Figure 3)

- Reported prevalence varied widely across studies
- Overall, increased prevalences of torticollis and plagiocephaly reported across multiple studies
- Overall results are inconsistent, highlighting variability in reporting
- Emphasizes the need for future research

Figure 2.

Study	Torticollis Reported	Plagiocephaly Reported	Combined Torticollis/Plagiocephaly Reported
Ambrosino et al., 2022	X	✓	X
Burns et al., 2023	X	X	✓
Kochav-Lev et al., 2023	✓	X	X
Lynch et al., 2024	X	✓	X
Di Renzo et al., 2022	X	✓	X
Gurevitz et al., 2023	X	✓	X
Schertz et al., 2013	✓	X	X

Note. ✓ = reported; X = not reported.

### Prevalence of Torticollis and Plagiocephaly (Figure 3)

- 2 studies reported data specific to torticollis in children later diagnosed with autism
- 4 studies reported data specific to plagiocephaly
- 1 study reported combined data on both torticollis and plagiocephaly
- Reported prevalence and frequency rates varied widely across studies due to differences in
  - Diagnostic criteria
  - Age at assessment
  - Study design and data sources

### Study Selection (Figure 1)

- A total of 281 records were identified across five databases
- After removal of duplicate, 230 titles and abstracts were screened
- 11 full-text articles were assessed for eligibility
- 7 studies met inclusion criteria and were included in the final scoping review

## Discussion

- An early diagnosis of musculoskeletal conditions, including torticollis and plagiocephaly, may increase the likelihood of a later autism diagnosis.
- Increased plagiocephaly severity was associated with increased likelihood of a later neurodevelopmental diagnosis.
- Early involvement within the medical system, such as through treatment for torticollis or plagiocephaly may be associated with earlier identification and diagnosis of autism.
- Significant variability in study design, diagnostic criteria, and reporting methods limited direct comparison, however it did highlight emerging patterns in diagnosis co-occurrence.
- This scoping review highlighted the limited body of evidence on this topic and emphasizes the need for future research, including prospective longitudinal studies on developmental outcomes in children with torticollis and plagiocephaly.

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