

# Assessment of Autism Spectrum Disorder in Children who are Deaf or Hard of Hearing



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## BACKGROUND

Autism Spectrum Disorder (ASD) has a higher occurrence in the deaf and hard of hearing (D/HH) population than in the total population. According to Roush & Wilson 2014, 1.7% of children who are D/HH have ASD, which is higher than the national prevalence of 1 in 68 (Mood & Shield 2014). Additionally, diagnosis of ASD often occurs later in children who are D/HH than in children with normal hearing, with an average age of formal diagnosis not until 6 years 4 months (Szarkowski, et al 2014). Some report common confusion over diagnosis because of overlapping symptoms, such as not responding to one's name and delayed language acquisition; however, early diagnosis of ASD is important for positive outcomes later on. This study aims to examine why these challenges occur and what can be done to help this population.

## PURPOSE

This systematic review aims to answer the following question: In children who are deaf or hard of hearing (D/HH), what are the strategies and challenges for accurate assessment of Autism Spectrum Disorder (ASD)?

## METHODS

### Databases Used:

- CINAHL, PsycInfo

### Search Terms:

("hearing loss" OR "hard of hearing" OR "hearing impair\*" OR deaf\* OR Deaf) AND (ASD OR auti\* OR Auti\* OR Asperger\* or PDD\* OR "Pervasive Developmental Disorder") AND (assess\* OR strateg\* OR eval\* OR screen\*)

### Search limiters:

- CINAHL: Academic Journals

Inclusion	Exclusion
Children under 21	Children over 21
Peer-reviewed journals	Unreviewed journals
Screening and diagnosis	Only intervention
Any severity of ASD and hearing loss	Population not ASD and D/HH

Titles and abstracts of each article from the search were blindly screened based on inclusion and exclusion criteria and relevance, with 50 articles double-screened. Then a full-text review was conducted for each article remaining, with each article double-screened. Quality appraisals were carried out blindly for each remaining article by each reviewer. Every step required 90% reliability or higher.

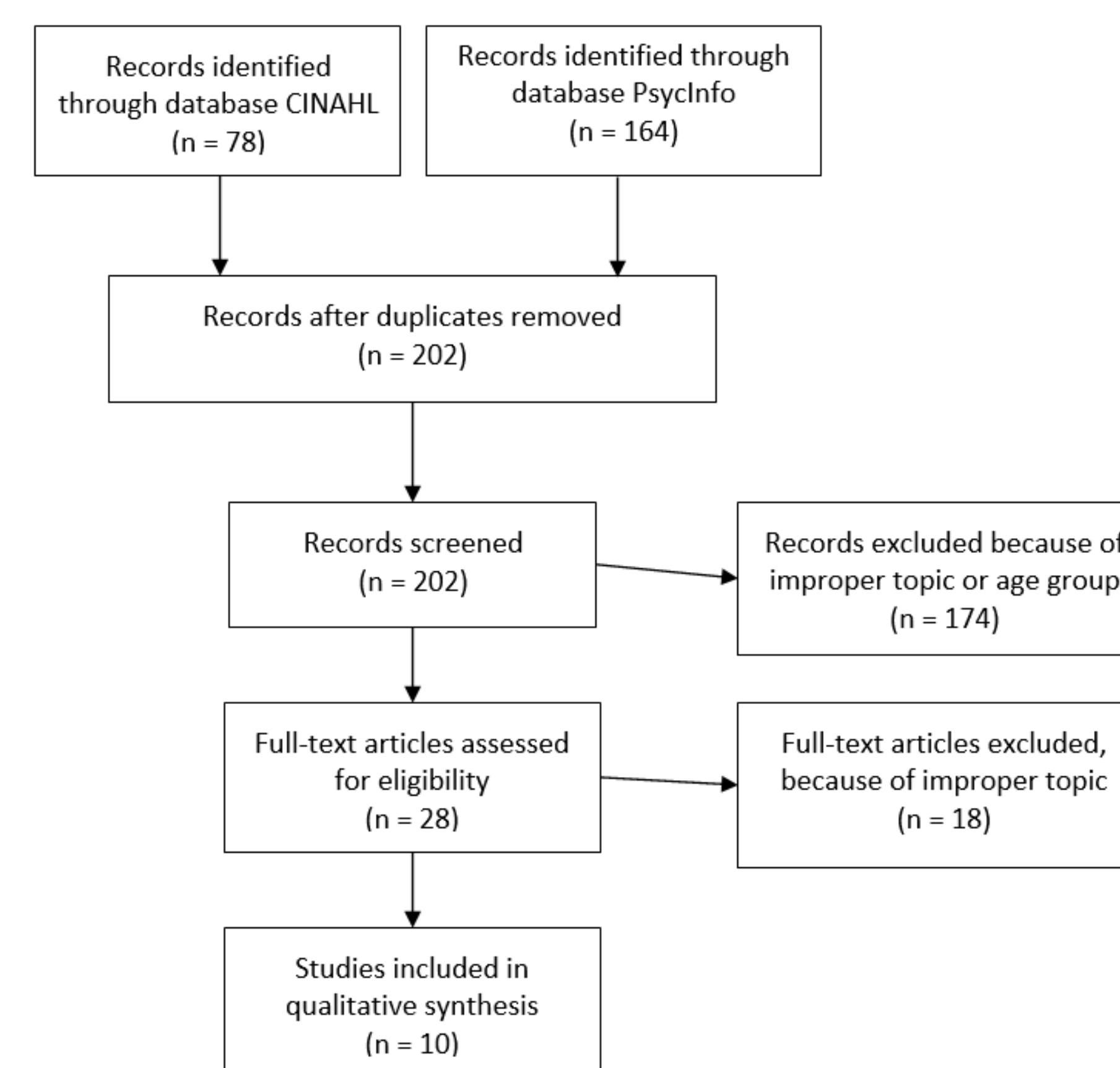
## RESULTS

### Reliability:

Title and Abstract Screen: 96%

Full Text Screen: 93%

Quality Appraisals: 90%



Study	Design	Quality	Screen/ Diagnose
Mood & Shield, 2014	Psychometric	Good	Diagnose
Kellogg et al, 2014	Case study	Good	Screen
Szarkowski, et al, 2014A	Descriptive	Good	Diagnose
Worley, et al, 2011	CCT	Good	Screen
Szarkowski, et al, 2014B	Expert Opinion	Good	Both
Carr, et al, 2014	Psychometric	Lesser	Screen
Burns, et al, 2016	CCT	Lesser	Screen
Brenman, et al, 2017	Qualitative	N/A	Diagnose
Roper, et al, 2012	CCT	Lesser	Screen
Schum, 2004	Expert opinion	Lesser	Both

## REFERENCES

References available upon request:  
 Megan Brown: [megan\\_brown@med.unc.edu](mailto:megan_brown@med.unc.edu)  
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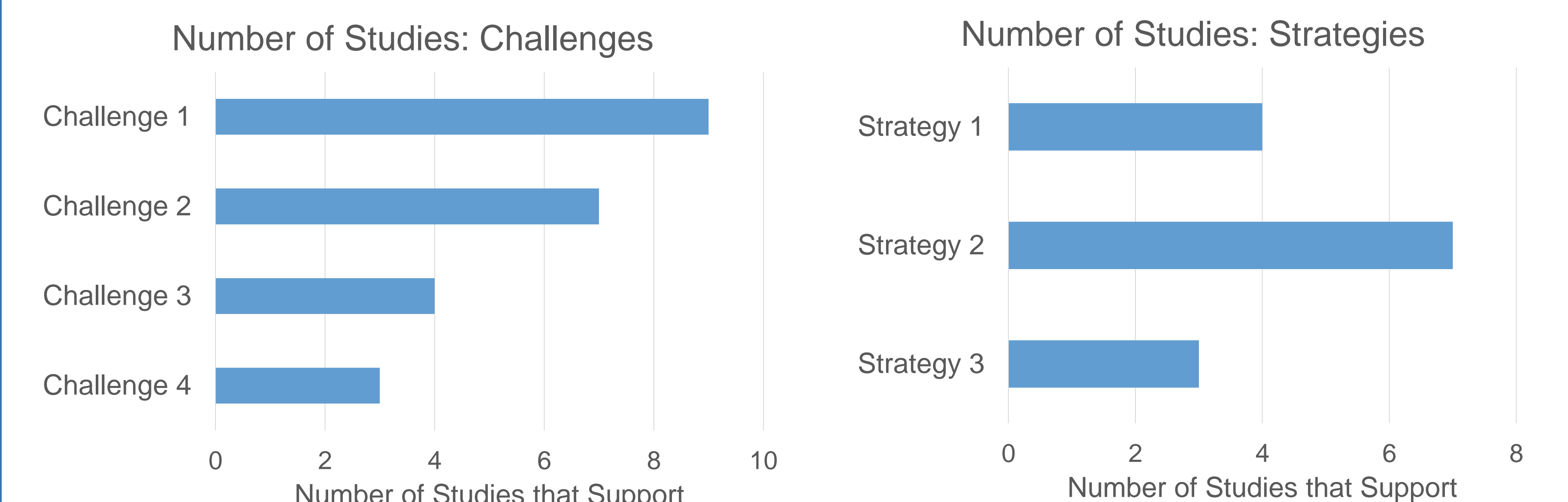
## RESULTS

### Challenges:

- 1) Some of the well-known red flags for ASD are common in typically-developing children who are D/HH (language delay, lack of response to name)
- 2) The gold-standard assessments for ASD are not designed for children who are D/HH
- 3) Professionals are not dually-trained to work with ASD and deafness
- 4) Accurate interpretation between spoken English and American Sign Language (ASL) is difficult for ASD assessments

### Strategies:

- 1) Assessments should be performed by a multi- or interdisciplinary team, having represented trained professionals for both fields, ASD and D/HH
- 2) Develop tools that work for D/HH population or modify current tools to make them appropriate for this population
- 3) If child who is D/HH regresses in development, they should be evaluated for ASD



## DISCUSSION

Most professionals are not trained to work in both ASD and deafness, which leads to later ASD diagnoses in this population. Without access to appropriate early intervention, these children are at risk for worse outcomes. Recognizing the common challenges associated with diagnosing ASD in children who are D/HH and implementing strategies to work through these challenges can help this population receive earlier, more accurate diagnoses and therefore earlier intervention to produce better outcomes later in life.

Several studies found potential screeners they found to be effective for assessing risk of ASD in children who are D/HH. Details about these tools and methods are found in Carr, et al 2014, Worley, et al 2011 & Burns, et al 2016.

This systematic review is not without limitations: five of the ten articles came from the same issue of the same journal, in which a team collaborated together on the studies. Additionally, the goals and methodology of the studies varied widely, making data synthesis difficult.