

Introduction

Autism Spectrum Disorder is a developmental disorder characterized by pragmatic and social deficits in conjunction with restrictive, repetitive behaviors. Due to the diversity of symptoms and severities across the spectrum, many clinicians are unsure at times which characteristics should be classified as being part of ASD or a separate comorbidity. Disfluencies are often fall into this grey area. As defined by ASHA, a fluency disorder "is an interruption in the flow of speaking characterized by atypical rate, rhythm, and repetitions in sounds, syllables, words, and phrases".¹ Many people with ASD present with these disfluencies described, but are not diagnosed with a fluency disorder clinically. Furthermore, results from a survey conducted in 2014 indicated that many speech language pathologists can identify disfluencies in their clients with ASD, but are unsure or uncomfortable treating them, leaving them undiagnosed.²

Research Question

In individuals with autism who exhibit disfluencies, what are the characteristics of those disfluencies, and what interventions are used to treat them?

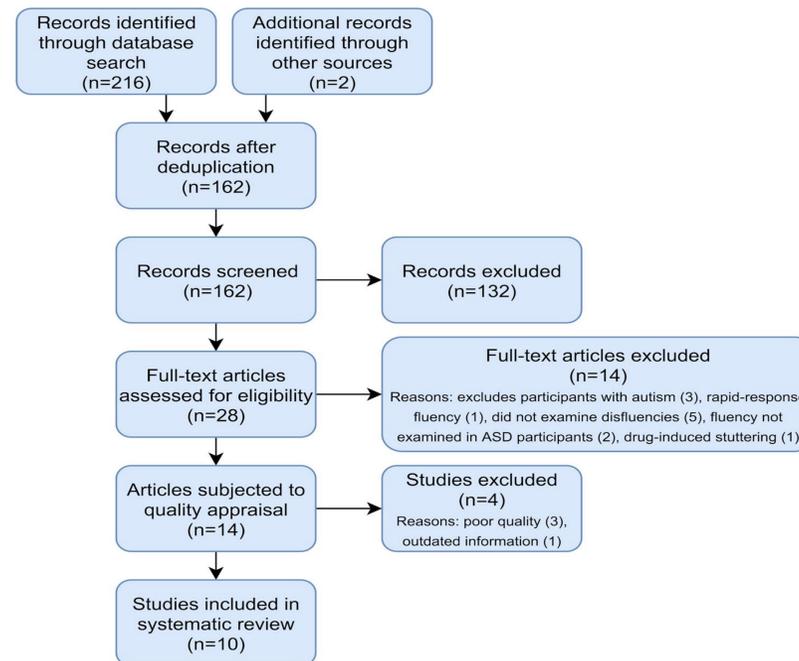
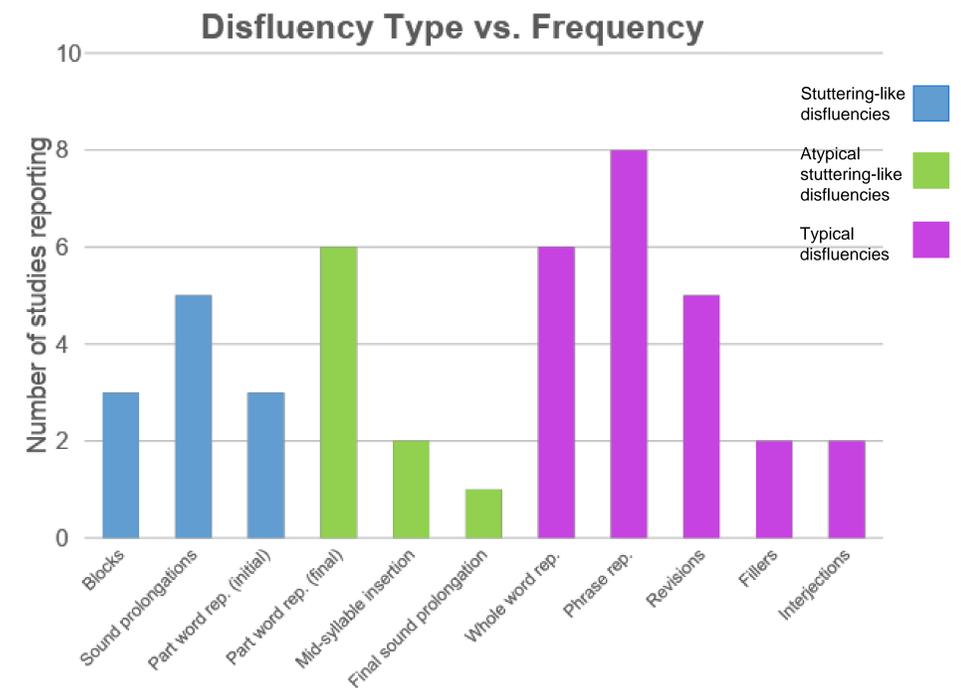


Fig. 1: Flowchart of appraisal process. Adapted from 2009 PRISMA Flowchart⁴



Method

Search Strategy:

- 5 databases (CINAHL, PubMed, ComDisDome, PsycInfo, and ERIC) using the following search string: "Autism spectrum disorder*" or "autism" or "asd" or "asperger*" or "autistic" or "pervasive developmental disorder" or "PDD" or "PDD-NOS" AND "stutter*" or "fluency disorder*" or "stammer*" or "dysfluenc*" or "disfluenc*" or "cluttering"
- Backchaining using most relevant articles

Inclusion Criteria:

- Described verbal disfluencies in individuals with ASD
- Official ASD (including Asperger's and PDD-NOS) diagnosis
- Peer-reviewed
- English

Exclusion Criteria:

- Diagnosis other than ASD (Rett Syndrome, Fragile X)
- Reading disfluencies

Article Appraisal:

- In each stage, inter-rater reliability was computed based on independent ratings of least 20% of articles:
 - Title/abstract scan: 98%
 - Full text review: 98%
 - Quality appraisal: 100%
- Quality appraisal completed using Joanna Briggs Institute's Critical Appraisal Tools checklists³

Results: Literature

- Appraisal process yielded 10 articles that met quality standards (6 high quality, 4 lesser quality). Study designs fell into the following categories:
 - Single case study: 3
 - Cohort comparison: 2
 - Descriptive study: 2
 - Cross-sectional study: 3
- While all 10 articles described disfluencies associated with ASD, only 3 discussed potential treatment options
- Small sample sizes and low power were common issues that affected the quality ratings of many studies
- All articles included only participants with high-functioning ASD

Results: Treatment Approaches

One high quality case study implemented a modified Fluency Rules Therapy Program with a 21 year old who exhibited typical and stuttering-like disfluencies, but no atypical stuttering-like fluencies. This therapy approach uses rule-based fluency shaping techniques to decrease behavioral aspects of stuttering. Results indicated the therapy was successful based on a decrease in percentage of stuttered words (%SW) from a baseline of 14.5%SW to 2.07%SW.

Two case studies implemented stuttering modification treatment (self-monitoring and correction) with 7 year olds to reduce the percentage of stuttered syllables. In both cases, the children with ASD exhibited primarily atypical stuttering-like disfluencies. In the high quality study, the percentage of stuttered syllables decreased from 11.30% to 1.72%. The second study was of lesser quality and did not provide statistical evidence, but stated that post-treatment measures indicated a reduction in frequency of atypical stuttering-like disfluencies.

Results: Disfluency Characteristics

ASD participants consistently exhibited more disfluencies than neurotypical controls across studies. Excessive typical disfluencies were most often observed (possibly attributable to almost all participants having high-functioning ASD). Atypical stuttering-like disfluencies as a category were far more common in participants with ASD than in both neurotypical controls and controls who only had a fluency disorder diagnosis. However, despite the presence of clinically-significant levels of disfluency in ASD participants, very few had received a formal fluency disorder diagnosis.

Clinical Implications

This systematic review supports the continued need for further research investigating larger, more diverse samples to generalize and further develop these characteristics and treatment approaches. Results suggests that the types of disfluencies seen in those with ASD are both qualitatively and quantitatively distinct, and there is a need for accurate identification of fluency disorders in this population. However, clinicians should also be aware that certain medications used to treat ASD, such as memantine, have been shown to increase stuttering-like behavior.⁵ Major limitations in the research include a lack of quantitative studies, small sample sizes, and non-representative samples (only high-functioning ASD).

Research indicates both stuttering modification and fluency shaping show promise in reducing the frequency of stuttering, but more varied and rigorous research is sorely needed. Importantly, none of the studies examined the emotional components of stuttering extensively. Many mentioned the person with ASD seemed unaware and had no emotional concerns regarding their disfluencies. However, people with ASD typically have difficulty recognizing and expressing emotions, limiting the ability to rely on typical measures used to assess this domain (e.g., OASES⁶).