



Sex differences in anxiety symptoms, emotional regulation, autism symptom severity, and response to school-based interventions in school-aged autistic children: an initial literature review

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Overview of Project and Project Goal

- Initial review of current literature regarding potential sex-differences within school-aged Autistic children regarding:
 - **Anxiety and emotional regulation**
 - **Autism symptom severity**
 - **Response to school-based interventions (targeting anxiety/emotional dysregulation)**
 - Sex-differences in anxiety amongst the general populations
 - Co-occurring anxiety in Autistic populations
 - Some potential theories of why the suggested relationships may exist
- Goal: This preliminary literature review serves as an early step within an upcoming secondary data analysis project

Methodology

- **PubMed**
 - MeSH search example:
 - (((("Anxiety"[Mesh] OR "Anxiety Disorders"[Mesh] OR "Generalized Anxiety Disorder"[Mesh]) OR "Mental Health"[Mesh]) AND ("Autistic Disorder"[Mesh] OR "Autism Spectrum Disorder"[Mesh])) AND ("Sex"[Mesh] OR "Sex Distribution"[Mesh] OR "Sex Factors"[Mesh])
 - Filters: human, English, +/- child (birth–18)
- **Cochrane Library**
 - List of terms as options to represent each concept, e.g. "mental health" OR "anxiety" OR "anxiety disorder" OR "generalized anxiety disorder"
 - Combined into “AND” statements
 - Filter: Cochrane Review format

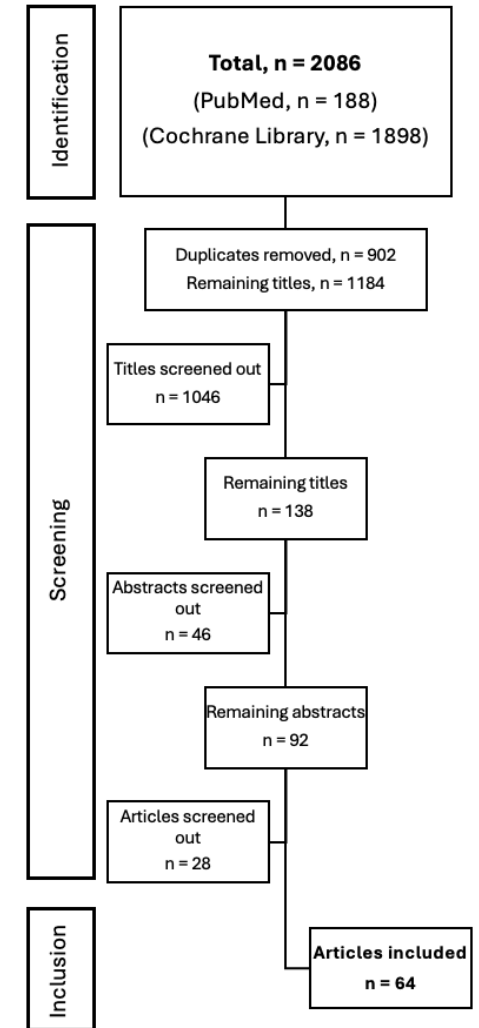


Figure 1. Flowchart reflecting the search process with numbers (n) of articles in each category.

Outcomes

- Found articles addressing:
 - Sex differences in autism severity
 - Autism and anxiety
 - Sex differences in anxiety and emotional regulation in general population
 - Sex differences in anxiety in autistic populations
 - Sex differences in response to cognitive-behavioral interventions in pediatric populations
- Meaning for interdisciplinary practice
 - Critical for self-advocates, family members, and all members of care teams to be aware of potential risk factors for and management of mental health concerns in Autistic populations

Sex Differences in Autism Severity

- Autism spectrum disorder is characterized by differences in two domains (Autism Speaks):
 - social communication and social interaction (SC)
 - restricted, repetitive patterns of behavior, interests, or activities (RRB)
- Variable results:
 - females > males **OR** no differences **OR** males > females
- May depend on:
 - age, source, symptom(s) evaluated
- Potential reasons:
 - biological differences, cognitive differences, research bias, and/or sociocultural differences
- Potential consequences:
 - delay in diagnosis

Autism and Anxiety

- Anxiety is one of the most common co-occurring psychiatric conditions in Autistic populations
- In general, higher rates of psychiatric symptoms (including anxiety) in the Autistic population
- Strength of association may depend on:
 - Age, source, type of anxiety
- Autistic children are more likely to have been seen by a mental health professional (in general, not necessarily for anxiety specifically)

Sex Differences in Anxiety and Emotional Regulation: General Population

- Most evidence suggests higher rates of anxiety in females than males (with some outlying studies); relationship may depend on type of anxiety
- Expressing emotions may improve emotional regulation for boys more so than for girls
- Why?
 - Cognitive factors, hormonal factors, and/or environmental/social factors

Sex Differences in Anxiety in Autistic Populations

- Mixed results on prevalence and trajectories
 - females > males **OR** no differences
 - may depend on developmental stage in adolescence
- Sex differences in Autistic populations compared to non-Autistic populations
 - One study: same lifetime prevalence of several anxiety disorders in adults
- Potential mediators and/or moderators
 - Camouflaging/masking, autism symptom severity, delayed diagnosis
- Why does it matter?
 - Quality of life, impact on family(?), suicidal ideation

Sex Differences in Response To Cognitive-Behavioral Interventions in Pediatric Populations

- Contradictory findings
 - Males > Females
 - Females > Males
- Strength of relationship may be impacted by age
- How might autism impact this?
 - Modifications to cognitive-behavioral therapy (CBT) may be helpful

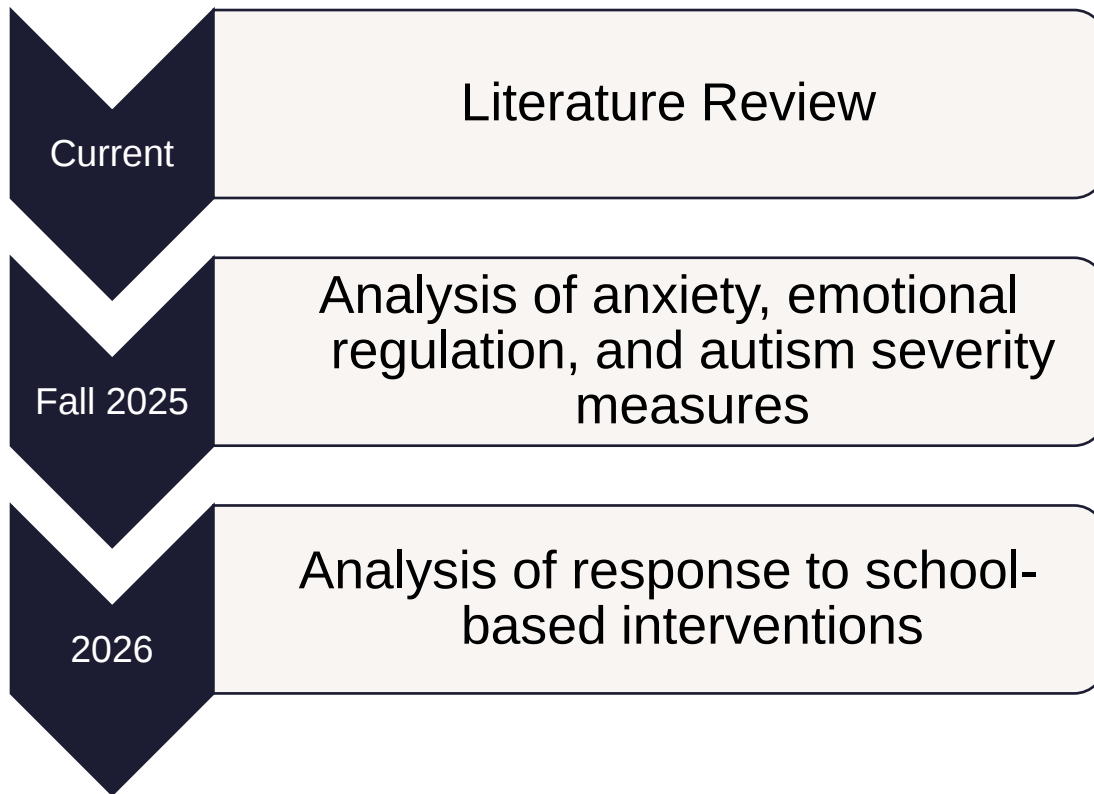
Product and Dissemination

- Product: Initial literature review paper
- Intended audience: Anyone interested in current research in this area
- Dissemination: To be incorporated into future manuscript for upcoming secondary data analysis

Future Directions: Next Steps

- Additional Literature Review
 - Additional search databases, such as Web of Science
 - InterLibrary Loans
 - Librarian-assisted professional literature review
- Secondary Data Analysis
 - Current study: A Comparison of Two School-based Interventions to Manage Anxiety in Autistic Students
 - Funded by Patient-Centered Outcomes Research Institute (PCORI)
 - Principal Investigator: Judy Reaven
 - **Secondary data analysis: sex-differences within this data based on anxiety and emotional regulation measures, autism symptoms severity, and response to the school-based interventions**

Future Directions: Tentative Timeline and Aims



Aim #1: Describe the differences (if any) between school-aged Autistic males and Autistic females in relation to anxiety measures, emotional regulation measures, and autism symptom severity.

Aim #2: Determine if there is a difference in response to school-based interventions based on sex in school-aged Autistic children.

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