International Journal of Speech-Language Pathology

ISSN: (Print) (Online) Journal homepage: www.tandfonline.com/journals/iasl20

Managing cyberbullying among adolescents with neurodevelopmental disorders: A scoping review

Emily Jackson, Mark Boyes, Barbara Blundell, Juliana Hirn & Suze Leitão

To cite this article: Emily Jackson, Mark Boyes, Barbara Blundell, Juliana Hirn & Suze Leitão (24 Jan 2025): Managing cyberbullying among adolescents with neurodevelopmental disorders: A scoping review, International Journal of Speech-Language Pathology, DOI: 10.1080/17549507.2025.2451305

To link to this article: https://doi.org/10.1080/17549507.2025.2451305

© 2025 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group.

View supplementary material

Published online: 24 Jan 2025.

Submit your article to this journal

Article views: 586

View related articles

View Crossmark data

Full Terms & Conditions of access and use can be found at
https://www.tandfonline.com/action/journalInformation?journalCode=iasl20

International Journal of Speech-Language Pathology, 2025; Early Online: 1–16

Taylor & Francis
Taylor & Francis Group

OPEN ACCESS Check for updates

Managing cyberbullying among adolescents with neurodevelopmental disorders: A scoping review

EMILY JACKSON[1], MARK BOYES[2], BARBARA BLUNDELL[1], JULIANA HIRN[3] & SUZE LEITÃO[1]

[1]*School of Allied Health and enAble Institute, Curtin University, Perth, Western Australia, Australia,* [2]*School of Population Health and enAble Institute, Curtin University, Perth, Western Australia, Australia,* [3]*School of Communication Sciences and Disorders, University of Central Florida, Orlando, Florida, USA*

Abstract

Purpose: While there is evidence for the effectiveness of programmes targeting cyberbullying in general adolescent populations, less is known for adolescents with neurodevelopmental disorders, who are at heightened risk of involvement in cyberbullying. This scoping review aimed to identify and map the evidence in relation to managing cyberbullying among adolescents aged 10–19 with neurodevelopmental disorders.

Method: The following databases were searched: ProQuest (including dissertations and theses), PsychInfo, MEDLINE, Scopus, and Google Scholar. Two independent reviewers screened the studies in two stages: Title and abstract, and full text.

Result: Twenty-nine studies were included; 19 involved exploring existing strategies used by adolescents with neurodevelopmental disorders, their parents, teachers, or service providers, to manage cyberbullying. The remaining 10 papers implemented and evaluated the effectiveness of cyberbullying prevention and/or intervention programmes.

Conclusion: While there is some emerging evidence for the efficacy of cyberbullying programs for adolescents with neurodevelopmental disorders, the literature is sparse. Future research should explore the efficacy of programmes delivered at classroom, small group, and individual levels and examine how adolescents with a range of neurodevelopmental disorders and diverse learning needs respond to such programmes. Critically, this may help reduce cyberbullying incidents and the subsequent impact on mental health among adolescents with neurodevelopmental disorders.

Keywords: *adolescents; neurodevelopmental disorder; cyberbullying; scoping review; intervention; mental health*

Introduction

Bullying is defined as repetitive and systematic behaviour that is aggressive or intended to be hurtful, which occurs between people with a power imbalance (Beckman et al., 2020). Bullying can take various forms, including verbal, social, and physical, and it may occur online (i.e. cyberbullying) via the use of electronic devices and/or internet platforms (Ng et al., 2022). Cyberbullying is often considered more severe than offline, or 'traditional', bullying as it can occur at any time of the day, perpetrators can be anonymous, and there may be a broader audience (Beckman et al., 2020). Cyberbullying acts can include online stalking and threatening violence, deliberate exclusion from chat rooms or groups, and impersonating others online (see Heyeres et al., 2021 for a review).

Both cyberbullying victimisation and perpetration in adolescence are associated with adverse mental health outcomes such as suicidality and self-harming behaviours (Islam et al., 2022). For instance, Campbell et al. (2012, 2013) found that young people targeted by cyberbullying (i.e. cyber victims) are at higher risk of experiencing stress and poorer mental health (e.g. depression, anxiety, and somatic symptoms). Furthermore, those who perpetrate or instigate cyberbullying (i.e. cyberbullies) experience reduced self-esteem and life satisfaction as well as

Correspondence: Emily Jackson, School of Allied Health, Curtin University, GPO Box U1987, Perth Western 6845, Australia. E-mail: Emily.jackson@curtin.edu.au

Supplemental data for this article can be accessed online at https://doi.org/10.1080/17549507.2025.2451305.

ISSN 1754-9507 print/ISSN 1754-9515 online © 2025 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group.
Published by Taylor & Francis
DOI: 10.1080/17549507.2025.2451305
This is an Open Access article distributed under the terms of the Creative Commons Attribution License (http://creativecommons.org/licenses/by/4.0/), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. The terms on which this article has been published allow the posting of the Accepted Manuscript in a repository by the author(s) or with their consent.

increased risk of mental health symptoms such as anxiety, depression, and conduct problems (see Zych et al., 2015 for a systematic review). This highlights the importance of identifying strategies to effectively manage young people's involvement as both victims and perpetrators of cyberbullying. We define *management* to include the ways in which an adolescent, or the people around them (e.g. families, teachers, health professionals), use strategies to prevent the adolescent's involvement in cyberbullying, to intervene and stop further involvement, and/or to manage the consequences if cyberbullying has occurred.

Management of cyberbullying in the general adolescent population

There are a range of methods described in the literature for the management of cyberbullying, with programmes generally aimed at preventing cyberbullying before it occurs (e.g. through education and promotion of positive online behaviours) or intervening to mitigate the impacts of cyberbullying once it has occurred (see Hutson et al., 2018, for a summary). As overviewed by Heyeres et al. (2021), varied approaches may be used in cyberbullying prevention and/or intervention, including skill development (e.g. identifying cyberbullying and using protective online behaviours), psychoeducation (e.g. to understand the impact of cyberbullying), collaboration with adults (e.g. parents and educators supporting adolescents to deal with cyberbullying, such as avoiding or responding to negative online interactions), and policy changes (e.g. criminalising online cyberbullying behaviours).

A body of literature has investigated the effectiveness of such prevention and/or intervention programmes for cyberbullying in adolescents, especially among the general population (defined here as those who have no diagnoses significantly impacting learning, communication, or behaviour). For instance, in an umbrella review, Heyeres et al. (2021) identified 10 previous reviews on the topic of cyberbullying prevention and intervention among adolescents. All 10 reviews explored the impact of school-based cyberbullying programmes on adolescents' attitudes towards, and involvement in, cyberbullying. Overall, these programmes were found to have had a significant effect on reducing cyberbullying incidences, as quantified by Gaffney et al.'s (2019) meta-analysis that showed cyberbullying programmes reduced victimisation and perpetration rates by approximately 14% and 10–15%, respectively. Programmes that also integrated parent education were identified as being among the most effective (Gaffney et al., 2019; Hutson et al., 2018).

A key gap in the cyberbullying management literature identified by Heyeres et al. (2021) was the lack of research involving minority populations (e.g. LGBTQ+ youth). Additionally, one of the included reviews (Hutson et al., 2018) highlighted the lack of research exploring the implementation of interventions in healthcare settings. Hutson et al. (2018) described this as an important focus for future research, given that healthcare providers are often able to provide cyberbullying education to adolescents, especially when those adolescents are experiencing secondary health and mental health symptoms associated with cyberbullying victimisation. In summary, previous research has broadly shown the effectiveness of interventions for managing cyberbullying among general adolescent populations, especially when delivered within a school-based model.

Management of cyberbullying for adolescents with neurodevelopmental disorders

Neurodevelopmental disorders (NDDs) are a group of conditions that emerge during the early developmental period (APA, 2016). While prevalence rates vary and there are high comorbidities between disorders, the most common NDDs include developmental language disorder ([DLD], 7%; Norbury et al., 2016), attention deficit-hyperactivity disorder ([ADHD], 5–11%), autism spectrum disorder ([ASD], 0.70–3%), specific learning disorders ([SLDs], 3–10%), and motor disorders (0.76–17%; Francés et al., 2022). Among young people with NDDs, rates of mental health problems—including internalising (e.g. anxiety, depression) and externalising behaviours (e.g. conduct problems)—are significantly higher than among neurotypical peers (Augustine et al., 2022). Adolescents with NDDs are also at increased risk of cyberbullying, which may exacerbate existing mental health conditions (Beckman et al., 2020; Emerson et al., 2022). This may be due to a range of factors; for instance, young people who are Autistic or have DLD often exhibit challenges with oral and/or social communication, such as the use and understanding of vocabulary, humour and sarcasm, and other hidden messages (Durkin et al., 2010; Ellis Weismer et al., 2018). These difficulties may lead to challenges expressing themselves effectively in online interactions, as well as misinterpretation of the behaviours of online communication partners. Similarly, this pattern has been observed in young people with ADHD (Wehmeier et al., 2010). Young people with NDDs may also have difficulty controlling frustrations and impulsivity, leading to a higher likelihood of being drawn into online negative interactions (Sciberras et al., 2012).

There is a well-established link between bullying victimisation and depression in later life, school absenteeism, reduced academic achievement, and suicidal behaviour (Islam et al., 2022). Furthermore, adolescents with NDDs are at higher risk of both mental health difficulties and cyberbullying (Beckman et al., 2020). Therefore, it is important young people and their support networks (e.g. teachers, health professionals), can access programmes and resources that support them to manage cyberbullying. Such resources must also be suitable and accessible to adolescents with NDDs who often have diverse learning.

While a large body of literature has examined cyberbullying management among the general population (e.g. as described in the umbrella review by Heyeres et al., 2021), little prior research has explored management of cyberbullying among adolescents with NDDs. Given the prevalence of NDDs, it is likely that adolescents with NDDs took part in the aforementioned general population research investigating the effectiveness of cyberbullying education and intervention at the school level (Heyeres et al., 2021). However, in general, no information about students' developmental history was reported in the studies, making it difficult to ascertain whether adolescents with NDDs participated in the research, and whether the programmes were effective for these young people. Furthermore, there has been limited reporting on whether adjustments were made to the delivery of these preventative education programmes to suit their learning needs and whether their responses were different to those of neurotypical participants in the classes.

To our knowledge, only one previous review (published after Heyeres et al.'s 2021 umbrella review) has explored issues relating to cyberbullying management among adolescents with NDDs. Shelton et al. (2024) focused on adolescents with a specific type of NDD, language disorders. While they did not explicitly examine cyberbullying management, they conducted a scoping review on the topic of social media use and intervention to support social media use. Of the 44 studies included in their review, most studies examined social media use, with only two studies focusing on intervention. The authors highlighted the need for further research to identify the effective components of interventions (e.g. dosage and intensity, intervention format, and targeted skills). Shelton et al. offered important insights into social media skill development for young people with language disorders. Nonetheless, there remains a gap in the literature in relation to the broader topic of cyberbullying management in adolescents with language disorders and indeed other NDDs (e.g. ASD, ADHD, SLDs), motivating the current scoping review.

Review aims and objectives

The objective of this scoping review was to examine and map the range of evidence in relation to management (i.e. prevention or intervention) of cyberbullying among adolescents (aged 10–19 years; WHO, 2023) with NDDs. We aimed to identify studies that explored participants' existing knowledge and use of management strategies, as well as the experimental implementation and evaluation of new programmes designed to address cyberbullying. A preliminary search of MEDLINE, the Cochrane Database of Systematic Reviews, and JBI Evidence Synthesis was conducted, and no current or previous systematic reviews or scoping reviews on the topic were identified. A scoping review methodology was appropriate in supporting our aim of broadly identifying the kind of evidence available on the topic (Peters et al., 2020). The research question guiding this scoping review was: What is the extent and nature of the literature investigating strategies to manage (i.e. prevent, educate, or intervene) cyberbullying for adolescents with NDDs? A sub-question was: What is the effectiveness of these strategies?

Method

The review followed the Joanna Briggs Institute (JBI) scoping review methodology (Peters et al., 2020). This included: 1) Identifying inclusion and exclusion criteria in accordance with the characteristics of population, concept, and context, 2) identifying types of evidence sources and a search strategy, 3) screening and selection of relevant evidence, and 4) data extraction. The findings are presented in a narrative summary in the results section. The protocol was uploaded to the PsyArXiv Preprints online repository on September 5th, 2022 (https://osf.io/preprints/psyarxiv/5qa29). Given the iterative nature of scoping reviews, minor changes to the original proposed methodology occurred (detailed in Supplemental Materials).

Identifying inclusion and exclusion criteria

Eligibility criteria

Using the aspects of population, concept, and context (Peters et al., 2020), we developed search terms and eligibility criteria through discussions among the research team. The full list of search terms can be found in Supplementary Materials.

Population. We included studies if any of the participants were adolescents (10–19 years old; WHO, 2023) and if any were reported to have any NDD, defined according to the Diagnostic and Statistical Manual of Mental Disorders 5th Edition (APA, 2016). Additionally, studies were included if the participants were other stakeholders (e.g. parents, teachers, health professionals) that were reporting on adolescents with NDDs. NDDs included intellectual disability and related disorders, ASD, ADHD, specific learning disorders, and communication disorders (e.g. DLD). Studies were not required to report on evidence for the adolescents' diagnosis (e.g. standardised assessment results) to be considered for inclusion. We excluded studies that only included children (i.e. those under the age of 10) or only adults (defined here as being over the age of 19). Similarly, we excluded studies that only included participants with an acquired condition (e.g. language disorder associated with brain injury). Finally, studies with participants from any socioeconomic or cultural and linguistic background were included. Due to project resource limitations, only materials available in English were included.

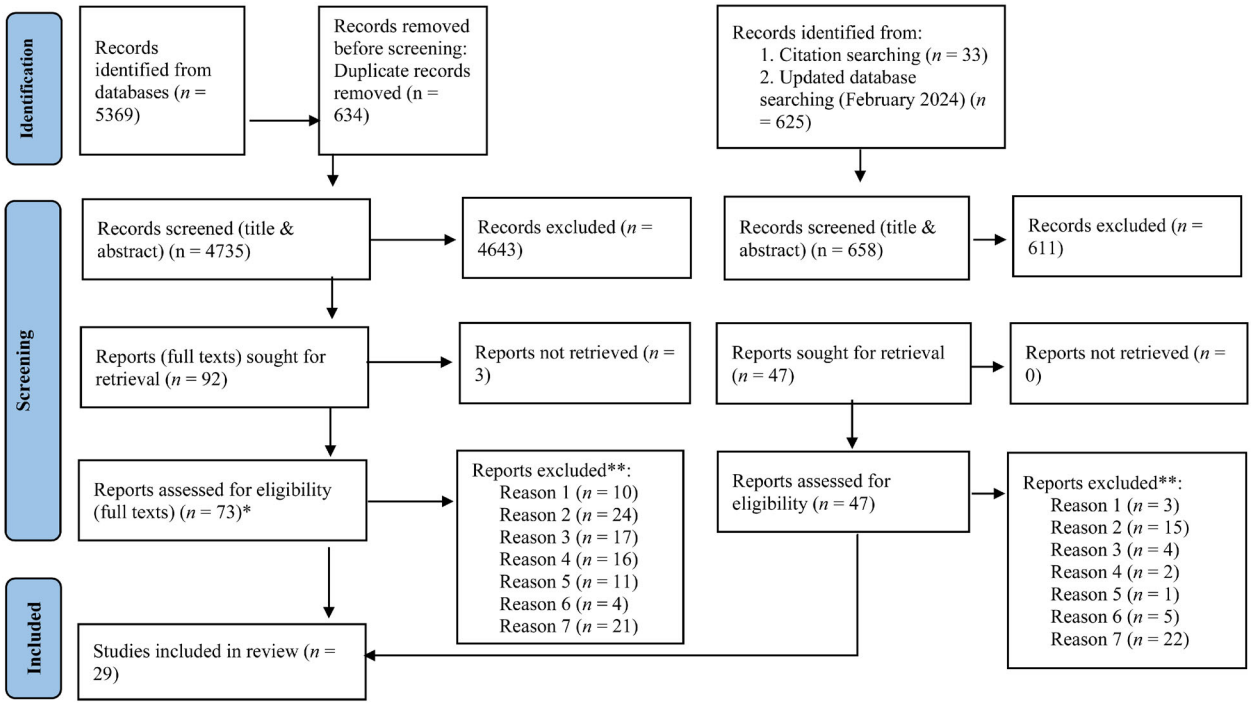

Figure 1. Preferred reporting items for systematic review flowchart for study selection.
*At this point in the review, it was determined that books, book chapters, and review papers would be excluded.
**Some full texts were excluded for more than one reason.
Note. Reasons for exclusion were as follows: Reason 1) The evidence relates only to someone's use of screen media or electronic use (e.g., television watching, with no interaction with others). Reason 2) No description of prevention, education, promotion, or intervention pertaining to cyberbullying. Reason 3) Study or evidence relates to internet or social media use with no focus on strategies or methods for learning those skills and preventing harm. Reason 4) The study or evidence only relates to offline ('traditional') bullying or other non-digital issues. Reason 5) The study only reports on internet use as the intervention (e.g. internet use as a means of improving social skills or inclusion). Reason 6) Age incorrect (participants are only children [9 years old or younger] with no participants who fall within adolescent band [10–19 years] or participants are only adults [i.e., 20 years or older]). Reason 7) There are no participants described as having an NDD.

Concept. The identified evidence needed to relate to the concept of cyberbullying. This also included consideration of evidence for related concepts, such as online or digital safety, and social media capabilities. Additionally, studies needed to report on programmes, strategies, or resources for the prevention, education, or intervention for the issue of cyberbullying. We excluded studies that only reported on the prevalence or impact of cyberbullying among adolescents with NDDs. Studies were considered if they involved exploration of existing management strategies, or the implementation and evaluation of management strategies that had not previously been used by the participants.

Context. There were no exclusion criteria regarding context; we considered evidence regarding the management of cyberbullying that had been implemented by any person (e.g. teacher, peer, parent) in any context (e.g. clinic, school, or home).

Identifying types of evidence sources and a search strategy

In consultation with a health science librarian, we developed an initial set of search terms based on our knowledge of the existing literature. We conducted an initial limited search of the ProQuest database (see Supplemental Materials) in August 2022 to identify preliminary articles. Text words contained in the titles and abstracts of relevant articles, and index terms, were used to develop a full search strategy for ProQuest, PsychInfo, MEDLINE, Scopus, and Google Scholar. The first author ran a full search of these databases in September 2022, followed by an updated search in February 2024 (see section below for details). We set search limits to English language, scholarly journal articles, theses and dissertations, and sources published between 2012 and 2022 to capture contemporary research on the topic.

Screening and selection of relevant evidence

We uploaded all identified citations into EndNote (Version X9) to remove duplicates, then imported all records into an Excel spreadsheet for screening (the study selection process is reported in the PRISMA diagram in Figure 1; Page et al., 2021). Two independent reviewers conducted pilot screening of 25 randomly selected abstracts based on eligibility criteria, with 96% agreement. The inclusion criteria were reviewed, and the definition of *interventions* was clarified. The two reviewers independently screened all titles and abstracts, with a high degree of agreement (96%). All discrepancies were discussed with a third reviewer until consensus was reached. The two

reviewers evaluated the full texts and had 81% agreement. Disagreements were discussed and resolved with a third reviewer. The reference lists of all included studies were screened for additional potentially relevant studies. Eight sources were identified, yielding a total of 25 included studies. Prior to submission of the current manuscript, we ran an updated search of all databases (February 2024) to identify if any additional studies had been published in the interim. The search procedure of the databases was replicated (dates restricted to September 2022 to current). A further four studies were identified, yielding a total of 29 studies.

Data extraction

We developed a data extraction form, guided by exemplars in the JBI manual (see Supplemental Materials). The first author extracted data for all sources, and a second author independently checked the data extraction for 20% of sources, resulting in minor changes to extracted data on sampling characteristics and intervention methodologies for five studies.

Result

Twenty-nine studies (seven theses and 22 peer-reviewed journal articles) were included. Many originated from the US (n=15), although eight other countries were represented, including Australia, UK, and Israel (see Tables I and II).

Participant characteristics

Approximately three-quarters of the included studies (21 studies, 72%) included adolescents with NDDs as the participants. The remaining eight studies included a population other than the adolescent as the participants (e.g. parents/caregivers, educators, or service providers). Adolescents aged 10–19 years were represented across all studies, with five also including participants older than 19 years of age. A range of NDDs were represented, with the most common including ASD ($n = 15$), intellectual disability ($n = 5$), (specific) learning disorder ($n = 8$), ADHD ($n = 8$), and spoken communication impairment such as language disorder ($n = 8$), noting that some studies included more than one NDD diagnosis among the participant group(s) (see Tables I and II for a full summary).

Management of cyberbullying

Included studies explored the management of cyberbullying in two ways: a) An exploration of strategies currently (or previously) used to manage cyberbullying (19 studies; see Table I), or b) the implementation and evaluation of a programme with participants to address cyberbullying or related issues (10 studies; see Table II). Often the included studies had several aims (e.g. they also examined the prevalence or impact of cyberbullying); we report only on the study findings that were relevant to the aims of our scoping review.

Existing strategies used to manage cyberbullying

Across 19 studies, participants reported current or past strategies used to manage cyberbullying. All of these studies had a cross-sectional research design, with 10 being qualitative in nature, seven quantitative, and two mixed methods. There was variety in terms of who participated and shared perspectives (e.g. adolescents, teachers, speech-language pathologists [SLPs]).

The perspectives of adolescents. Nine studies explored only the perspectives of adolescents with NDDs. Adolescents in Bannon et al. (2015), who were Autistic and/or had 'learning difficulties', reported they tried to prevent cyberbullying by being aware of information that should not be shared online (e.g. residential address, telephone number). Rocheleau and Chiasson (2022) identified similar attitudes and protective behaviours around online safety among Autistic and non-Autistic adolescents, with common strategies including managing who can access online profiles and negotiating consent for what friends can post about them. Notably, Autistic participants reported receiving support and education on how to manage online risks from family members, teachers, friends, and healthcare providers (e.g. SLPs), and many of these young people reported concerns about the education they received. For instance, they disliked the restrictive, "checklist-like" list of online behaviours to avoid, as well as the "overly repetitive and boring" (Rocheleau & Chiasson, 2022, p. 18) curriculum offered at school on cyberbullying.

Heiman and Olenik-Shemesh (2015) identified that students with learning disabilities attending general education classes more often used 'cyber-attack' strategies in response to cyberbullying and tended not to disclose the incident (compared to students with learning disabilities in special education classes and to typically developing students). While participants reported on the impact of cyberbullying on their socio-emotional and/or physical wellbeing (e.g. anxiety, loss of appetite), there was no objective evaluation regarding the effectiveness of cyberbullying management strategies (Heiman & Olenik-Shemesh, 2015).

Ko (2014) identified the importance of peers in managing cyberbullying, with their participants (Autistic adolescents) highlighting the importance of peer support in alleviating negative feelings associated with being cyberbullied and that peers deterred instigators from cyberbullying others, especially in online gaming communities. Parental supervision was discussed in several studies, with some adolescents reporting supervision to be useful (e.g. asking for

Table I. Summary of studies exploring existing strategies for managing cyberbullying.

Project	Study design	Participant group/s	Diagnosis/es	Summary of most common strategies
Bannon et al. (2015), UK	Qualitative	Adolescents	Range of NDDs (ASD, LD, other)	Learning from experience, learning from others, parental supervision, maintaining privacy by not adding strangers online.
Borgström (2023), Sweden	Qualitative	Adolescents	ID	Problem-focused coping to deal with demands for managing privacy and online negative situations.
Bowen (2023), USA	Mixed methods (quantitative: Cross-sectional)	Adolescents, parents, and teachers	ASD	83% of students report bullying to school staff. Adolescents sceptical about how parents would respond, avoid negative experiences, find seeking help effective, and find trusting adult and positive peer relationships important.
Bridgewater (2022), USA	Qualitative	Teachers	(Teachers of adolescents with) ASD	Building relationships with students and families, social skills training, modelling, building a school vision for addressing bullying, and targeting social-emotional learning. Mixed findings regarding teachers' confidence levels to work with (cyber)bullying victims and perpetrators; teachers identified need for further training and resources.
Carrington et al. (2017), Australia	Qualitative	Adolescents and parents	ASD	Recommendations to schools: Preventative measures (e.g. increase communication between students, parents, and authorities), and intervention measures (e.g. improving school anti-bullying policies). Recommendations to government: Preventative measures (e.g. governments should revisit bullying legislation), and interventions (e.g. clearer consequences for cyberbullying).
Cavallini (2022), Italy	Quantitative (cross-sectional)	Parents	Range of NNDs (ASD, ADHD, other[a])	Two main types of parental mediation: Use of controls/active medication and co-use of the internet. No significant differences in the use of these types of controls among parents of children with and without SEN.
Cook et al. (2017), USA	Quantitative (cross-sectional)	Service providers (mental health professionals, educators, SLPs, and other)	Range of intellectual and developmental disabilities	Providing support and performing an action in response to bullying (e.g. reporting). These were perceived as more effective than minimising/ignoring and education. Service providers significantly more likely to take action and use education when the individuals they worked with experienced cyberbullying more frequently ($p < .001$).
Dawson et al. (2022), USA	Quantitative (cross-sectional)*	Adolescents	ADHD	Adolescents reported that parents use a range of mediation/monitoring methods (e.g. rules of internet use, being friends on social platforms). A reduction in online risk-taking behaviour among the adolescents was significantly associated with adolescents' perception of their parents' knowledge of their online behaviours (e.g. knowledge that they had been a cyber-victim or aggressor, $p < .05$).
Gómez-Puerta and Chiner (2020), USA	Quantitative (cross-sectional)	Teachers	ID	Reported feeling underprepared and/or not sufficiently trained to manage online risks among students but use a range of strategies. Most common strategies: Talking to students about their use of the internet, discussing the risks of dating strangers online and inappropriate websites. Significantly more secondary education teachers felt prepared to prevent online risks (39%) compared to primary teachers (21%; $p = .024$) and to address these risks (21% to 15%, respectively, $p = 0.038$). Special education teachers implemented strategies significantly more frequently than general education teachers ($p = .024$), and different patterns of strategy were noted among primary versus secondary teachers.
Guckert (2013), USA	Qualitative	Adolescents and teachers	Range of NDDs: ADD, ADHD, LD	Teachers: Tended not to have good knowledge of laws, school procedures, or strategies to deal with cyberbullying but were aware of their roles as either proactive or reactive bystanders to cyberbullying. Students had varied knowledge of strategies: avoiding, blocking, ignoring, and avoiding. Students identified they take on roles as passive bystanders, active interveners, or bully bystanders, in certain cyberbullying situations.
Heiman and Olenik-Shemesh (2015), Israel	Quantitative (cross-sectional)	Adolescents	Range of NDDs (LD, ADHD, communication / language disorder, other)	Compared to students with LDs in special education classes and typically achieving students, students with LDs in general education classes were significantly more likely to use the strategies of cyber-attack and laugh about being cyberbullied, and significantly fewer students disclosed the cyberbullying incident to others and disconnected the internet.
Ko (2014), USA	Qualitative[b]	Adolescents	ASD	

(*Continued*)

Table I. (*Continued*).

Project	Study design	Participant group/s	Diagnosis/es	Summary of most common strategies
				Reportedly effective prevention strategies included avoiding social media platforms, having private profiles, seek help from authority figures, and use "avoid, ignore, leave" (p. 79). Peer support reported to reduce negative feelings associated with being cyberbullied.
Macmillan et al. (2022), UK	Qualitative	Adolescents	ASD	Avoiding or limiting online contact with others and interacting with only a small group of trusted people online. Parental mediation was used (i.e. monitoring social media accounts and restricting online access). Adolescents check for visual clues of online scams or harm but need more training in schools and support to block unwanted people.
Phillips and Anderson (2020), USA	Qualitative	Service providers (public librarians)	ASD	Currently offering education on this topic for adolescents with ASD but some felt a responsibility to do so and raised the need for collaboration between libraries and schools (e.g. libraries could build on digital citizenship education provided in schools). Inclusive programming in libraries may benefit adolescents with and without ASD.
Robertson (2013), USA	Qualitative	Adolescents and parents	Range of NDDs (ASD, ADD/ADHD, LD, language disorder)	Defensive strategy (e.g. avoid/ignore or leave the situation) as learned from teachers and/or parents. Strategies difficult to put into practice in every instance (e.g. in fast-moving situations). Parental monitoring of adolescents online seems to discourage cyberbullying threats (e.g. regular observation of child's devices, enforcing restrictions on certain sites). Adolescents are sometimes met with unhelpful attitudes from authorities when reporting (e.g. parents, teachers), resulting in no meaningful action. Allies and real friends come to aid when cyberbullying occurs.
Rocheleau and Chiasson (2022), Canada	Qualitative	Adolescents	ASD	Adolescents with ASD seemed more opposed to online risk taking than those without ASD. Both groups used a range of similar strategies to mitigate online risks (e.g. managing access to online profiles, negotiating consent, and being careful about who to trust online).
Shelton et al. (2023), Australia	Mixed methods (quantitative: (Cross-sectional)	Service providers (SLPs)	Language disorders	50% rarely/never ask adolescents and/or their parents/carers about the adolescent's use of social media, 73% rarely/never target social media use in intervention, and 5% agreed with the statement that adolescents of interest receive adequate SLP support for social media use. Some SLPs use client-centred practices to assess and provide support for social media among adolescents, transferring knowledge of support they provide in offline contexts to online. A range of client/family, SLP, and societal factors impact practices for supporting social media.
Wright (2017), USA	Quantitative (cross-sectional)*	Adolescents	ASD	Significant negative correlation between perceived levels of parental mediation of technology and cybervictimisation rates ($p < .001$). High levels of perceived parental mediation of technology use were significantly associated with a weaker relationship between cyberbullying and depression among adolescents ($p < .001$).
Wright (2018), USA	Quantitative (cross-sectional)*	Adolescents	ASD	Significant negative association between cybervictimisation and parental mediation of technology use ($p < .001$) and between cybervictimisation and perceived social support from parents ($p < .001$).

Note. ADD = attention deficit disorder; ADHD = attention deficit hyperactivity disorder; ASD = autism spectrum disorder; LD = learning disability; NDD = neurodevelopmental disorder; SEN = special educational needs; SLPs = speech-language pathologists.
*Effectiveness of strategies on cyberbullying was evaluated quantitatively in these studies.
[a]"Other" includes diagnoses that are not NDDs (e. social, emotional, behavioural disorders).
[b]Reported on adolescents' standardised testing in the Methodology.

Table II. Summary of studies exploring implementation and evaluation of programmes targeting cyberbullying.

Project	Study design	Participant group(s)[a]	Diagnosis/es	Model of programme	Summary of most common strategies / findings
Agganis (2018), USA	Quantitative (longitudinal; multiple baseline design)	Adolescents[a]	ASD	Small group	Significant increases in social media safety skills for all participants with a large effect size aggregated across lures (weighted average Tau $U = 0.07$). Maintenance of skill set and spontaneous genersalisation by all participants for some lures (7, 14, 21 days after training removed).
Brino et al. (2022), USA	Quantitative (longitudinal; pre-post within-groups design)	Adolescents	ADHD (and other[c])	Combined	Significant reduction in severity of problematic internet use with a large effect size (Cohen's $d = 2.3$). Significant decrease in depression and/or anxiety symptoms with a large effect size (Cohen's $d = 1.6$). 3. Significant reduction in screen time with a large effect size (Cohen's $d = 1.9$). High attendance rates (89–100%) reported for sessions.
Espelage et al. (2015), USA	Quantitative (longitudinal; randomised controlled trial)	Adolescents[b]	Range of NDDs (ID, LD, language disorder)	School	Significant reduction in bullying perpetration across the four time points (small effect size, Cohen's $d = -0.20$). Non-significant effect for bullying victimisation. Non-significant effect for physical aggression.
Grace et al. (2023), Australia	Mixed methods (longitudinal; pre-post design)	Adolescents	Communication impairment	Combined	Significant increases in performance ($p < .001$) and satisfaction with performance ($p < .032$; effect sizes not reported) on the COPM. All participants met expected level of goal achievement on at least 1 of 3 intervention goals on the GAS. All participant groups perceived that the intervention facilitated progress towards goals for social media use.
Olenik-Shemesh et al. (2018), Israel	Quantitative (longitudinal; pre-post between-groups design)	Teachers[b]	ADHD	School	Significant improvements in knowledge of cyberbullying post-intervention ($p < .05$) and sense of self-efficacy coping with cyberbullying ($p < .05$) compared to pre-intervention for Group 1 (effect sizes not reported). Non-significant changes in knowledge between the three groups from pre- to post-intervention ($p = .11$). Significantly greater improvements in sense of efficacy in Group 1 and Group 2 compared to Group 3 ($p < .05$).
Osuna et al. (2024), USA	Quantitative (longitudinal; randomised controlled trial)	Adolescents[a]	ASD	Small group	100% adherence to treatment fidelity checklists. High level of agreement regarding satisfaction with treatment. Peer mentors reported enjoyment and perceived benefits for participants. Combined "Utility" and "Anxiety" difference scores were non-significant between the experimental and control conditions. 56% of experimental participants had higher Facebook engagement after intervention (as rated by Autistic and non-Autistic peers) compared to control group ($p = .03$). Significant reduction in goal difficulty from pre-to post-intervention ($p = .03$).
Raghavendra et al. (2015), Australia	Mixed methods (longitudinal; pre-post within-groups design)	Adolescents[b]	Range of NDDs (ID, ASD, GDD)	Individual	Significant increases in online performance ($p < .01$) and satisfaction with performance ($p < .01$; effect sizes not reported) on the COPM. Six of eight participants attained their goals as expected (GAS). Significant increase in number of participants' online communication partners ($p < .01$).
Raghavendra et al. (2018), Australia	Mixed methods (longitudinal; pre-post within-groups design)	Adolescents[b]	Range of NDDs (ID, LD, other[c])	Individual	Significant increase in performance ($p < .001$) and satisfaction with performance ($p < .001$) with large effect sizes ($d = 2.32$ and 2.66) (COPM). Six of the nine participants achieved their social media goals at or above the levels expected (GAS). Significant increase in the number of online communication partners ($p = .028$ with a medium effect size, $d = 0.69$). Interview data identified that the adolescents improved their social participation and independence.
Sullivan et al. (2017), USA	Quantitative (longitudinal; pre-post between-groups design)	Adolescents	Range of NDDs (language disorder, LD, other[c])	School	No significant main effects for intervention condition for aggression, anger regulation coping, or social skills and externalising problems. However, intervention effects were moderated by disability status. Students without disabilities showed an increase in anger regulation for the combined intervention. Students with disabilities showed higher social skill ratings in the combined intervention condition post-intervention.
	Quantitative (longitudinal; pre-post	Adolescents[a]	Range of NDDs (LD, ASD, ADHD)	School	Significant reductions in experimental group (compared to control group's) involvement in cyberbullying as victims and perpetrators immediately post-

(*Continued*)

Table II. (*Continued*).

Project	Study design	Participant group(s)[a]	Diagnosis/es	Model of programme	Summary of most common strategies / findings
Touloupis and Athanasiades (2022), Greece	between-groups design)				intervention and at 6-month follow-up ($ps < .017$). Students with SEN were significantly less likely to be involved in cyberbullying as victims ($p = .011$) or as bullies ($p = .031$) compared to students without SEN immediately after the intervention. Significant interaction effect of the type of SEN on involvement in cyberbullying immediately after intervention ($p < .001$, *partial* $\eta^2 = 0.39$) and at 6-months follow up ($p < .001$, *partial* $\eta^2 = 0.41$). Results suggested students with ASD and ADHD (compared to learning disabilities) demonstrated a relatively greater benefit.

Note. AAC = augmentative and alternative communication; ADD = attention deficit disorder; ADHD = attention deficit hyperactivity disorder; ASD = autism spectrum disorder; COPM = Canadian Occupational Performance Measure (Law et al. 1990); GAS = Goal Attainment Scale (Kiresuk & Sherman, 1968) GDD = global developmental delay; ID = intellectual disability; IQ = intelligence quotient; LD = learning disability; NDD = neurodevelopmental disorder; SEN = special educational needs; SLPs = speech-language pathologists.

[a]Inclusion of comparison group.

[b]Reported on adolescents' standardised testing.

[c]"Other" includes diagnoses that are not NDDs (e.g. social, emotional, behavioural disorders).

their parents' help to change their passwords; Bannon et al., 2015). In contrast, the study by Bannon et al. (2015) highlighted that some adolescents avoided being supervised online by parents. Adolescents with intellectual disability also reported on this "dilemma of support" (Borgström, 2023, p. 15), where they wanted to seek support regarding negative online experiences but feared being punished by parents.

In three of the eight studies, researchers objectively evaluated the effectiveness of adolescents' perceived parental support for managing cyberbullying. In Dawson et al. (2022), adolescents with ADHD (aged 13–16) reported that their parents use a range of methods for monitoring their online activities via a standardised measure and parental knowledge of online behaviours was associated with a reduction in online risk-taking behaviour among the adolescents. Similarly, Wright (2017) found that high levels of parental mediation of technology were associated with a weaker relationship between cyberbullying and depression (but not loneliness or anxiety) among Autistic adolescents. Wright (2018) also identified that cyberbullying among Autistic adolescents was negatively associated with perceived social support and parental mediation of technology use.

Macmillan et al. (2022) also explored Autistic adolescents' perceptions of parental monitoring using qualitative methods. They found that the adolescents reported that their parents monitored their social media accounts and, at times, restricted online access. Additionally, these Autistic adolescents highlighted their knowledge and used of a range of other strategies, such as avoiding or limiting online contact with unfamiliar people and checking for 'visual clues' of online harm. These adolescents also highlighted the need for more contemporary training at school for cybersafety and support with blocking unwanted online interactions.

The perspectives of parents. One study explored only the perspectives of parents. Cavallini (2022) included parents of adolescents with and without special educational needs ([SEN]; e.g. Autism, ADHD), who reported on their concerns with and mediation of, their child's online activities. Two main types of parental mediation were identified: The use of controls (or 'active mediation') and co-use of the internet. No significant differences were found between SEN and non-SEN parental groups regarding the frequency of use of either type of parental mediation (Cavallini, 2022).

The perspectives of professionals. Four studies explored only the perspectives of professionals, including educators, librarians, and service providers. Bridgewater (2022) identified that teachers use a range of strategies to manage cyberbullying among Autistic and non-Autistic students, including building relationships with students and families, social skills training,

modelling, building a school vision for addressing bullying, and targeting social-emotional learning. There were mixed findings regarding teachers' confidence levels to work with cyberbullying victims and perpetrators (Bridgewater, 2022). Similarly, Gómez-Puerta and Chiner (2020) identified that teachers felt underprepared and/or not sufficiently trained to manage online risks among students with intellectual disability. However, teachers did use a range of strategies (e.g. discussing the risks of dating strangers online and identifying inappropriate websites). Special education teachers tended to implement strategies more frequently than other teachers (Gómez-Puerta & Chiner, 2020).

Phillips and Anderson (2020) interviewed seven public librarians, who reported that they tend not to offer online safety education for Autistic youth despite feeling a responsibility to do so. These librarians highlighted that inclusive programming is important (i.e. that online safety education programming for Autistic youth would also benefit neurotypical youth). Cook et al. (2017) explored the perspectives of service providers (including mental and allied health professionals and educators). The most used strategies among these professionals to address cyber bullying included providing support and performing an action in response to bullying (e.g. reporting). These strategies were perceived as more effective than ignoring the incidents or providing education. Service providers were more likely to act and use education when the individuals they worked with experienced cyberbullying more frequently (Cook et al., 2017).

Sixty-one SLPs shared their opinions in a study by Shelton et al. (2023) on how they support adolescents (aged 12–14 years) with communication disabilities to use social media. SLPs "rarely/never" asked adolescents or their parents/carers about their use of social media (50% and 63%, respectively), and 73% rarely/never targeted goals relating to social media use in intervention. Those SLPs who did assess and provide support for social media use reported that they used interviews as an assessment tool, and they targeted goals around the use and potential impact of social media, as well as content and conventions for social media use. A range of client/family, SLP, and societal factors impacted practices for supporting social media and recommendations were made for developing speech-language pathology practice guidelines (Shelton et al., 2023).

The perspectives of adolescents and adults. Two studies explored the perspectives of both adolescents and parents. Robertson (2013) reported that Autistic adolescents tended to use a defensive strategy to combat cyberbullying (i.e. avoid/ignore or leave the situation). However, these adolescents acknowledged this strategy can be difficult to implement in 'fast-moving' online communication situations. Robertson (2013) also found that parental monitoring (e.g. regularly checking their child's devices) discouraged cyberbullying threats. In contrast, Robertson (2013) found that "social-cultural barriers hindered reporting bullying to authorities" (p. 132), with adolescents sometimes being faced with unhelpful attitudes from authorities when reporting cyberbullying, resulting in no meaningful action. Carrington et al. (2017) interviewed Autistic adolescents and their parents to explore recommendations for how to address cyberbullying. Recommendations to schools included the importance of enforcing preventative (e.g. increase communication between students, parents, and authorities) and intervention measures (e.g. schools need anti-bullying policies and greater responsivity to the issue). Furthermore, the participants identified recommendations to government for prevention and intervention (e.g. revising cyberbullying legislation and consequences of perpetration; Carrington et al., 2017).

Guckert (2013) worked with students with a range of NDDs and their teachers and identified that certain conditions facilitated cyberbullying in inclusive settings among students with and without NDDs. Key factors (e.g. school/peer culture, adolescents' prior cyberbullying involvement) were found to influence perceptions and actions of bystanders, who reacted in a range of ways (e.g. as 'active interveners', witnesses, or bystander perpetrators; Guckert, 2013).

Bowen (2023) explored perspectives of Autistic 11–14-year-olds and their parents and teachers and found a high degree of consistency between adolescents and teachers regarding procedures for reporting cyberbullying, with help-seeking considered the most effective. However, adolescents reported scepticism about how their parents might respond. Other strategies included avoidance, the importance of a trusted adult, and positive peer relationships (Bowen, 2023).

Implementation and evaluation of programmes to address cyberbullying

Ten of the 29 studies involved implementing and evaluating the effectiveness of a programme for managing cyberbullying among adolescents with NDDs (see Table II). The study design for all 10 studies was longitudinal in nature: Nine used quantitative methods (one multiple baseline, three pre-post between groups, three pre-post within groups, and two randomised controlled trials), with the final study using a mixed methods approach. Four of the studies explored programming in a classroom or whole-school model, two were individualised, two were in a small group model, and two took a combined approach. The length and number of programme sessions differed across studies, ranging from a one-off 4 hour teacher training workshop (Olenik-Shemesh et al., 2018) through to 13–15 sessions (delivered in one 50 minute session per week or two 5 minute sessions per week) in each year across a three year period

(Espelage et al., 2015; see Table S2 for a full summary).

Classroom or school-based programmes. Touloupis and Athanasiades (2022) investigated the effects of a school-based intervention for 11–12-year-olds with and without SEN (including SLD, ASD, and ADHD). The experimental group received the Threat Assessment of Bullying Behaviour in Youth intervention. The programme (delivered over 4 hours in the classroom by trained general and special educators) was supplemented with audiovisual and experiential activities targeting self-esteem. Rates of cyberbullying involvement (as victims and perpetrators) had significantly reduced post-intervention and at two week and six month follow-ups. Students with SEN benefitted more from the intervention compared to those without SEN and students with ASD and ADHD (compared to SLDs) demonstrated a relatively greater benefit. Self-esteem negatively predicted engagement in cyberbullying (Touloupis & Athanasiades, 2022).

Sullivan et al. (2017) evaluated the efficacy of a combined intervention approach: The school-level Olweus bullying prevention program ([OBPP]; Olweus & Limber, 2007) and classroom-based universal violence prevention approach: The second step: Student success through prevention program (Children, 2008). This was in comparison to the OBPP approach alone. Students (aged 11–15-years-old) from 14 classrooms were randomly allocated to an intervention condition. There were no significant main effects for the combined intervention condition on measures such as aggression and bullying. However, there were gender-moderated effects whereby boys who received the combined intervention (compared to OBPP alone) had greater decreases in bullying behaviours. Notably, while the interventions were described as having cyberbullying components, the outcome measure related to bullying in general, so the impact of the intervention on cyberbullying specifically was not clear.

Espelage et al. (2015) investigated the effectiveness of a social-emotional learning programme (the second step curriculum) on bullying (including cyberbullying) with 11–12-year-olds with a range of NDDs in comparison to the stories of us programme (control). The intervention was conducted over a 3 year period and significant improvements were observed in the intervention condition compared to the control condition for bullying perpetration. As with Sullivan et al. (2017), the outcome measures of bullying were not specific to online cyberbullying.

Olenik-Shemesh et al. (2018) developed and evaluated an intervention that aimed to build teachers' knowledge, perceptions, and self-efficacy for managing cyberbullying in schools. Fifty-nine middle school teachers, whose classes included students with ADHD, were allocated to three groups. Group 1 (experimental) attended the intervention training programme, group 2 (control group 1) had attended previous training on cyberbullying, and group 3 (control group 2) had never received training. The intervention involved teachers attending a 4 hour workshop covering cyberbullying and awareness raising. There were non-significant changes in teacher knowledge about cyberbullying in response to the intervention, however, teachers in groups 1 and 2 showed significantly greater improvements in sense of efficacy compared to group 3 (Olenik-Shemesh et al., 2018).

Small group programmes. Agganis (2018) delivered and evaluated a social media safety skills intervention to a small group of Autistic young adults, covering skills like blocking, declining, and reporting threats when using Facebook via presentations and role plays. Outcome measures, administered at baseline, generalisation, spontaneous generalisation, and follow-up time points, included researchers observing the young adults engage in online activities and rating their behaviours (replying and reporting). There were significant increases in social media safety skills for all participants and maintenance and generalisation of skills (Agganis, 2018).

Osuna et al. (2024) evaluated the feasibility, acceptability, and preliminary effectiveness of the socialisation, education, and learning for the internet (SELFI) programme with Autistic adolescents and adults. The programme involved online group sessions and covered skills such as creating online profiles, disagreeing with others online and responding flexibly depending on the relationship with the online communication partner/s. Peer mentors were available for personal support in the group sessions. Participants reported a high level of agreement regarding satisfaction with treatment. Additionally, most participants in the experimental group had higher Facebook engagement (as rated by Autistic and non-Autistic peers), and there was a significant reduction in perceived goal difficulty around safe and effective use of the internet (Osuna et al., 2024).

Individualised programmes. Raghavendra et al. (2015) provided an intervention targeting online social media skills with eight adolescents (11–18-year-olds) who had communication disabilities associated with intellectual disability, ASD, or global developmental delay. Following individual goal setting, the intervention (delivered in-home) included developing tailored guidelines for cybersafety, providing equipment, and communication supports (e.g. building word banks and messaging templates). Post-intervention interviews with adolescents and parents highlighted shared perceptions of improvements in communication style and frequency, social connectedness, intelligibility, and literacy. Adolescents also increased the number of online communication partners pre- to post-

intervention (Raghavendra et al., 2015). Raghavendra et al. (2018) delivered a similar intervention as in Raghavendra et al. (2015), with nine 14–19-year-olds with a range of NDD diagnoses (including intellectual disability, ASD, and learning disorders). A significant increase was observed post-intervention on the individual areas of social media that were identified as problematic. There was also a significant increase in the number of online communication partners. Interview data identified that the adolescents improved their social participation and independence, as well as literacy skills (Raghavendra et al., 2018).

Combined approach

Individualised and small group. Grace et al. (2023) explored the effectiveness of an online mentoring programme on alternative and augmentative communication (AAC) users' (13–18-year-olds) social media skills. Two adult mentors (experienced AAC users) delivered the intervention individually across 16 weeks via email and social media, which was supplemented by four structured group conversations online. There were significant increases in both performance and satisfaction with performance and all participants met their expected level of goal achievement on at least one of three intervention goals. Additionally, the AAC user participants and their parents perceived that the intervention facilitated progress towards goals for social media use.

Individualised, adolescent-family, and small group. Brino et al. (2022) evaluated the impact of a social media hygiene intervention on social media use and mental health symptoms for adolescents (12–19-year-olds) with problematic internet use receiving outpatient mental health treatment. Associated co-occurring conditions among the adolescents included ADHD. The intervention was administered by a healthcare provider at the outpatient facility via telehealth and involved five 1 hour sessions per week (one adolescent-family session, three peer group sessions, and one individual session). Broadly, the intervention included discussions based on topics such as consequences of problematic internet use, strategies to limit screen time as a family, and risky versus safe applications. There was a significant reduction in the severity of problematic internet use, depression and/or anxiety symptoms, and screen time, with large effect sizes (Brino et al., 2022).

Discussion

Cyberbullying victimisation rates are elevated in adolescents with NDDs, which can have a significant impact on their mental health and wellbeing (Beckman et al., 2020; Emerson et al., 2022). While previous research has explored the efficacy of education and intervention programmes for cyberbullying with general adolescent populations (e.g. see Heyeres et al., 2021), little research has investigated this with adolescents with NDDs, prompting the need for this scoping review. We identified 29 published papers meeting inclusion criteria. Many studies (19/29) explored strategies that had been previously used, or were currently being used, by adolescents with NDDs and their support networks (including parents, educators, and/or service providers). In contrast, 10 studies implemented and evaluated programmes or strategies aimed at preventing cyberbullying and promoting online safety behaviours among adolescents with NDDs and/or their educators.

As this is the first known scoping review on this topic, we felt it important to broadly scope the literature involving adolescents who had a NDD diagnosis. We found most participants to have ASD, ADHD, and/or intellectual disability. This is perhaps unsurprising, given that social communication difficulties are known features of these diagnoses (APA, 2016), motivating researchers to explore methods for addressing cyberbullying among these young people. Challenges with social communication are also a core feature of language disorders, so it was somewhat surprising that only eight studies were identified that included participants described as having impaired spoken communication skills, such as a language disorder (Agganis, 2018; Espelage et al., 2015; Grace et al., 2023; Heiman & Olenik-Shemesh, 2015; Raghavendra et al., 2015; Robertson, 2013; Shelton et al., 2023; Sullivan et al., 2017). This represents an important gap in the literature, especially given the likely impact that oral and written language impairments can have on a young person's ability to use the internet and social media safely and effectively (Durkin et al., 2010; Shelton et al., 2023).

Existing strategies for managing cyberbullying

Across the included studies, adolescents with NDDs, their parents, teachers, and service providers demonstrated knowledge of a broad range of strategies for preventing cyberbullying. Most studies took a descriptive approach to explore strategy use, making it difficult to ascertain strategy effectiveness. Nevertheless, descriptive exploration of the strategies described across studies revealed that there were strategies commonly used by adolescents and their supporters (e.g. parents/caregivers and teachers) to avoid cyberbullying or to respond to it if it occurred. To avoid cyberbullying, common strategies included implementing privacy measures, exercising caution about who to trust online, avoiding social media platforms altogether, and having online interactions monitored by parents. Common strategies in response to cyberbullying if it occurred included seeking support from authority figures (usually parents or teachers) or peers, ignoring the negative interactions, and blocking profiles of cyberbullies on social media

platforms. These strategies used by the adolescents with NDDs were largely consistent with strategies observed in the literature concerning adolescents without NDDs (e.g. see Heyeres et al., 2021 for a review), suggesting that there may not be a need for separate strategies for adolescents with NDDs. However, this is an important area for future research as few studies included in our review reported on a) whether management strategies were effective for mitigating cyberbullying, b) where the stakeholders had learned those strategies, and c) whether education had been tailored to the needs of the adolescent with NDDs.

Specifically, only half of the included studies explored whether the stakeholders' knowledge of managing cyberbullying had a positive impact on the experiences of cyberbullying (e.g. a reduction in cyberbullying victimisation frequency) or associated socio-emotional outcomes for the adolescents with NDDs. For example, Dawson et al. (2022) found that adolescents' perceptions of their parents' monitoring of their online activities was associated with a reduction in the adolescents' online risk-taking behaviour. Given the higher prevalence of mental health challenges among adolescents with NDDs (Augustine et al., 2022), which can be compounded by cyberbullying involvement (Beckman et al., 2020; Emerson et al., 2022), future research should evaluate strategies for managing cyberbullying and promoting socio-emotional wellbeing among these vulnerable young people.

Additionally, most studies did not report on where the participants had learned how to manage cyberbullying, making it difficult to discern details about educational strategies (e.g. types of programs, who and where the education was delivered) that may be useful for adolescents with NDDs. There was also minimal reporting on whether any education provided to the adolescents and their supporters had been tailored to suit their individual learning requirements. This is likely to be important and should be the focus of future research, given that adolescents with NDDs often have different learning needs, especially when it comes to understanding and engaging with communication in online and face-to-face contexts (Ellis Weismer et al., 2018).

Implementation and evaluation of programmes and management strategies

We reviewed 10 studies that involved the implementation and evaluation of an educational programme relating to preventing and/or providing intervention relating to cyberbullying. Notably, cyberbullying was sometimes subsumed into programmes targeting the broader topics of online safety (e.g. Osuna et al., 2024) or bullying (including face-to-face bullying; Sullivan et al., 2017). The programmes were delivered in varied models (e.g. whole-class, individual, combined), a range of NDD diagnoses were represented in the participants across these studies and mixed effectiveness was reported.

In the classroom or at whole-school level, there were contrasting findings across the studies. For instance, Espelage et al. (2015) found that students with a range of NDDs showed significant reductions in bullying involvement and fighting frequency over a 3 year period following the second step curriculum (Children, 2008). In contrast, Sullivan et al. (2017) found no significant main effects on measures of bullying following implementation of the combined OBPP (Olweus & Limber, 2007) and second step curriculum. These contrasting findings may, at least in part, be attributed to the differing intensity of the intervention, with Espelage et al. (2015) examining the effects of programming over a 3 year period and Sullivan et al. (2017) over a 5 month period. Similar diagnoses were reported among the participants in the two studies, including learning disabilities and speech-language impairments, however, the specific profiles of their language and/or learning strengths and challenges were not reported, making it difficult to interpret the potential impact of adolescents' different learning needs on their response to the intervention. Future research should aim to identify optimal programme intensities and explore which intervention components are most effective at reducing cyberbullying among students with various NDDs. Furthermore, it is important to note that studies targeting anti-bullying in general (e.g. Espelage et al., 2015; Sullivan et al., 2017) included education on cyberbullying, however, the outcome measures reported in the papers were on bullying in general. Future research should include outcomes specific to bullying in the online context, because while on- and offline bullying are similar, there may be specific intervention components that effectively mitigate bullying in one context but not the other (Gaffney et al., 2019).

While we found only three studies involving school-based cyberbullying programming for adolescents with NDDs, a large body of literature has demonstrated efficacy at significantly reducing the frequency of cyberbullying perpetration and victimisation among mainstream adolescents (e.g. see Heyeres et al., 2021's umbrella review). While presumably adolescents with NDDs were included in the classrooms that participated in this research, there was no description of the students' NDD diagnoses in the studies, nor how they responded to the interventions. These adolescents may indeed engage in, and respond positively to, school-based programming. However, given the range of additional learning needs that they may present with, it is likely that a higher degree of support and/or tailored programming is needed to facilitate learning about online safety and to reduce cyberbullying and this must be the focus of future research (Carrington et al., 2017).

We identified several studies that used a model of delivery other than school-based, including small group, individualised, or combined models; however, methodologies regarding target skills, outcome measures, and participant diagnoses were highly varied. For instance, Agganis (2018) and Osuna et al. (2024) utilised a small group format (face-to-face and online, respectively) with Autistic adolescents, and reported significant increases in effective social media engagement and safety skills. Significant positive effects were also found among individuals with communication disabilities in studies by Raghvendra et al. (2015) and Grace et al. (2023), who employed individual and combined models of intervention delivery, respectively. A combined approach was also effective for adolescents with ADHD in an outpatient mental health clinic (Brino et al., 2022). Taken together, the findings suggest that adolescents with varying diagnoses may benefit from individualised, small-group, and/or combined approaches to managing cyberbullying.

Except for the SELFI program in Osuna et al. (2024), no other interventions were described in replicable detail, making it difficult for practitioners to be able to utilise the programmes from the research in their practice. This was also identified as a limitation in the literature involving general populations (Hutson et al., 2018). Furthermore, as with the studies that used a school-based model of delivery, these studies generally lacked explicit reporting on the cognitive, language, and learning needs of the adolescents. This makes it difficult to draw conclusions about what kinds of intervention components would facilitate adolescents' learning in a way that supports their profile of strengths and challenges. It is critical that future research continues to develop and evaluate programmes that can be delivered in non-school settings (e.g. healthcare settings), with reporting on which adolescents benefitted from the programming and make these resources available to practitioners. This is important given that practitioners (e.g. psychologists) may be well-placed to provide support for adolescents with NDDs with cyberbullying, especially when they present to services experiencing secondary outcomes relating to cyberbullying victimisation (Hutson et al., 2018).

Conclusion

This scoping review examined and mapped existing evidence related to the management of cyberbullying among adolescents with NDDs. Most research involved exploration of strategies that are already used by adolescents and other key stakeholders, and generally these individuals demonstrated broad knowledge of strategies and shared knowledge of how to mitigate the issue of cyberbullying. Key strategies included measures for preventing cyberbullying, like managing online privacy (often with parental input to mediate online activities), as well as responding to, or intervening in, cyberbullying through measures such as blocking and reporting. Further research should explore the specifics of the education that they have received and the effectiveness of such strategies (e.g. via systematic review and meta-analysis), in order to identify where research and intervention resources should be dedicated moving forward.

A small number of studies involved implementation and evaluation of education or intervention programmes targeting cyberbullying, much of which were subsumed into programming relating to the broader topics of online safety or bullying more generally. There was emerging evidence of the effectiveness of such programmes across a range of service delivery models. This included evidence for the effectiveness of individualised training for improving online communication skills and confidence. Small group training was also effective for building social media safety skills. There was also some evidence for the effectiveness of school-based programming, especially when delivered over an extended time period (e.g. three years), on reducing the involvement of adolescents with NDDs in cyberbullying victimisation and perpetration, as well as building self-efficacy to cope with cyberbullying. Given the mixed evidence for effectiveness, further research is needed to substantiate such findings and identify effective intervention components for adolescents with various NDDs and diverse learning needs. This type of research is crucial in efforts to reduce cyberbullying rates and mitigate its adverse effects on the mental health and overall well-being of adolescents with NDDs.

Pre-registration

The protocol for this scoping review was published on PsyArXiv on September 5th, 2022 (https://osf.io/preprints/psyarxiv/5qa29).

Acknowledgements

The authors would like to acknowledge the support provided by Vanessa Varis, Health Science Librarian at Curtin University.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

The first author was supported by a grant through the Curtin enAble Institute. Mark Boyes is supported by the National Health and Medical Research Council, Australia [Investigator Grant 1173043].

ORCID

Emily Jackson http://orcid.org/0000-0002-2537-7387
Mark Boyes http://orcid.org/0000-0001-5420-8606
Barbara Blundell http://orcid.org/0000-0003-3224-7596
Suze Leitão http://orcid.org/0000-0003-3229-3226

References

Agganis, J. A. (2018). *Teaching Adolescents and Young Adults with Autism Spectrum Disorders How to Respond to Social Media Lures*. Florida Atlantic University.

American Psychological Association (APA). (2016). *Neurodevelopmental disorders: DSM-5® selections*. American Psychiatric Publications.

Augustine, L., Lygnegård, F., & Granlund, M. (2022). Trajectories of participation, mental health, and mental health problems in adolescents with self-reported neurodevelopmental disorders. *Disability and Rehabilitation*, *44*(9), 1595–1608. https://doi.org/10.1080/09638288.2021.1955304

Bannon, S., McGlynn, T., McKenzie, K., & Quayle, E. (2015). The internet and young people with Additional Support Needs (ASN): Risk and safety. *Computers in Human Behavior*, *53*, 495–503. https://doi.org/10.1016/j.chb.2014.12.057

Beckman, L., Hellström, L., & von Kobyletzki, L. (2020). Cyber bullying among children with neurodevelopmental disorders: A systematic review. *Scandinavian Journal of Psychology*, *61*(1), 54–67. https://doi.org/10.1111/sjop.12525

Borgström, Å. (2023). Tensions between risk, coping and support: Young people with intellectual disability in Sweden and internet-related support. *Disability & Society*, *38*(3), 460–482. https://doi.org/10.1080/09687599.2021.1946675

Bowen, L. W. (2023). *Bullying of middle school students with autism spectrum disorders: A qualitative exploration of prevalence and perceptions of students, parents, and teachers*. NC State.

Bridgewater, L. (2022). *Educators' Perspectives on Bullying and Cyberbullying Prevention and Intervention Efforts Within the Autism Spectrum Disorder Population*. Indiana State University.

Brino, K. A. S., Derouin, A. L., & Silva, S. G. (2022). Problematic internet use in adolescents and implementation of a social media hygiene protocol. *Journal of Pediatric Nursing*, *63*, 84–89. https://doi.org/10.1016/j.pedn.2021.10.011

Campbell, M., Spears, B., Slee, P., Butler, D., & Kift, S. (2012). Victims' perceptions of traditional and cyberbullying, and the psychosocial correlates of their victimisation. In P. K. Smith & G. Steffgen (Eds.), Emotional *and behavioural difficulties associated with bullying and cyberbullying* (pp. 161–173). Routledge.

Campbell, M. A., Slee, P. T., Spears, B., Butler, D., & Kift, S. (2013). Do cyberbullies suffer too? Cyberbullies' perceptions of the harm they cause to others and to their own mental health. *School Psychology International*, *34*(6), 613–629. https://doi.org/10.1177/0143034313479698

Carrington, S., Campbell, M., Saggers, B., Ashburner, J., Vicig, F., Dillon-Wallace, J., & Hwang, Y. (2017). Recommendations of school students with autism spectrum disorder and their parents in regard to bullying and cyberbullying. *International Journal of Inclusive Education*, *21*(10), 1045–1064. https://doi.org/10.1080/13603116.2017.1331381

Cavallini, M. C. (2022). *Digital parenting: Vulnerabilities and protective factors associated with children's exposure to online risks*. Catholic University of the Sacred Heart.

Children, C. F. (2008). *Second Step: Student success through prevention program*. Committee for Children.

Cook, E. E., Nickerson, A. B., Werth, J. M., & Allen, K. P. (2017). Service providers' perceptions of and responses to bullying of individuals with disabilities. *Journal of Intellectual Disabilities*, *21*(4), 277–296. https://doi.org/10.1177/1744629516650

Dawson, A. E., Wymbs, B. T., DuPaul, G. J., & Evans, S. W. (2022). Association of parenting behaviours and online risk-taking in adolescents with ADHD. *Children & Society*, *36*(6), 1126–1138. https://doi.org/10.1111/chso.12560

Durkin, K., Conti-Ramsden, G., & Walker, A. (2010). Computer-mediated communication in adolescents with and without a history of specific language impairment. *Computers in Human Behavior*, *26*(2), 176–185. https://doi.org/10.1016/j.chb.2009.10.007

Ellis Weismer, S., Kaushanskaya, M., Larson, C., Mathée, J., & Bolt, D. (2018). Executive function skills in school-age children with autism spectrum disorder: Association with language abilities. *Journal of Speech, Language, and Hearing Research*, *61*(11), 2641–2658. https://doi.org/10.1044/2018_JSLHR-L-RSAUT-18-0026

Emerson, E., Aitken, Z., King, T., Arciuli, J., Llewellyn, G., & Kavanagh, A. M. (2022). The association between disability and risk of exposure to peer cyber victimisation is moderated by gender: Cross-sectional survey. *Disability and Health Journal*, *15*(1), 101170. https://doi.org/10.1016/j.dhjo.2021.101170

Espelage, D. L., Rose, C. A., & Polanin, J. R. (2015). Social-emotional learning program to reduce bullying, fighting, and victimization among middle school students with disabilities. *Remedial and Special Education*, *36*(5), 299–311. https://doi.org/10.1016/j.dhjo.2021.101170

Francés, L., Quintero, J., Fernández, A., Ruiz, A., Caules, J., Fillon, G., Hervás, A., & Soler, V. (2022). Current state of knowledge on the prevalence of neurodevelopmental disorders in childhood according to the DSM-5: A systematic review in accordance with the PRISMA criteria. *Child and Adolescent Psychiatry and Mental Health*, *16*(1), 27. https://doi.org/10.1186/s13034-022-00462-1

Gaffney, H., Farrington, D. P., Espelage, D. L., & Ttofi, M. M. (2019). Are cyberbullying intervention and prevention programs effective? A systematic and meta-analytical review. *Aggression and Violent Behavior*, *45*, 134–153. https://doi.org/10.1016/j.avb.2018.07.002

Gómez-Puerta, M., & Chiner, E. (2020). Teachers' perceptions on online behaviour of students with intellectual disability, risk mediation and training. *European Journal of Special Needs Education*, *35*(4), 437–450. https://doi.org/10.1080/08856257.2019.1703602

Grace, E., Shipman, J., Raghavendra, P., & McMillan, J. M. (2023). "You got an instant conversation": Goal progress and perceptions following an e-mentoring social media intervention for young people who use augmentative and alternative communication. *Journal of Communication Disorders*, *103*, 106328. https://doi.org/10.1016/j.jcomdis.2023.106328

Guckert, M. (2013). *Understanding bystander perceptions of cyberbullying in inclusive classroom settings*. George Mason University.

Heiman, T., & Olenik-Shemesh, D. (2015). Cyberbullying experience and gender differences among adolescents in different educational settings. *Journal of Learning Disabilities*, *48*(2), 146–155. https://doi.org/10.1177/0022219413492855

Heyeres, M., Carter, M., Lui, S. M., Low-Lim, A., Teo, S., & Tsey, K. (2021). Cyberbullying prevention and treatment interventions targeting young people: An umbrella review. *Pastoral Care in Education*, *39*(2), 125–151. https://doi.org/10.1080/02643944.2020.1827281

Hutson, E., Kelly, S., & Militello, L. K. (2018). Systematic review of cyberbullying interventions for youth and parents with implications for evidence-based practice. *Worldviews on Evidence-Based Nursing*, *15*(1), 72–79. https://doi.org/10.1111/wvn.12257

Islam, M. I., Yunus, F. M., Kabir, E., & Khanam, R. (2022). Evaluating risk and protective factors for suicidality and self-harm in Australian adolescents with traditional bullying and cyberbullying victimisations. *American Journal of Health Promotion*, *36*(1), 73–83. https://doi.org/10.1177/08901171211034105

Kiresuk, T., & Sherman, R. (1968). Goal Attainment Scaling: A general method for evaluating comprehensive community mental health programs. *Community Mental Health Journal*, *4*(6), 443–453. https://doi.org/10.1007/BF01530764

Ko, S. R. (2014). *Online experiences of adolescents with Asperger's syndrome and high-functioning autism*. Indiana State University.

Law, M., Baptiste, S., McColl, M., Opzoomer, A., Polatajko, H., & Pollock, N. (1990). The Canadian occupational performance measure: An outcome measure for occupational therapy. *Canadian Journal of Occupational Therapy. Revue Canadienne D'ergotherapie*, *57*(2), 82–87. https://doi.org/10.1177/000841749005700207

Macmillan, K., Berg, T., Just, M., & Stewart, M. E. (2022). Online safety experiences of autistic young people: An interpretative phenomenological analysis. *Research in Autism Spectrum Disorders*, *96*, 101995. https://doi.org/10.1016/j.rasd.2022.101995

Ng, E., Chua, J., & Shorey, S. (2022). The effectiveness of educational interventions on traditional bullying and cyberbullying among adolescents: A systematic review and meta-analysis. *Trauma, Violence & Abuse*, *23*(1), 132–151. https://doi.org/10.1177/1524838020933867

Norbury, C. F., Gooch, D., Wray, C., Baird, G., Charman, T., Simonoff, E., Vamvakas, G., & Pickles, A. (2016). The impact of nonverbal ability on prevalence and clinical presentation of language disorder: Evidence from a population study. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, *57*(11), 1247–1257. https://doi.org/10.1111/jcpp.12573

Olenik-Shemesh, D., Heiman, T., & Ben-Ari, D. K. (2018). Developing, implementing, and evaluating an intervention program on cyberbullying for teachers. *International Journal of Learning and Teaching*, *4*(4), 299–305. https://doi.org/10.18178/ijlt.4.4.299-305

Olweus, D., & Limber, S. P. (2007). *Olweus Bullying Prevention Program: Teacher guide*. Hazelden.

Osuna, A., Sabini, K., Yamane, E., Flores, J., Pierce, N., Lemus-Valle, J., & Vernon, T. (2024). Socialization, Education, and Learning for the Internet (SELFI): A pilot RCT of a social media skills group program for Autistic adults. *Journal of Autism and Developmental Disorders*, *54*(10), 3639–3656. https://doi.org/10.1007/s10803-023-06100-9

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., … Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *International Journal of Surgery*, *88*, 105906. https://doi.org/10.1136/bmj.n71

Peters, M. D., Marnie, C., Tricco, A. C., Pollock, D., Munn, Z., Alexander, L., McInerney, P., Godfrey, C. M., & Khalil, H. (2020). Updated methodological guidance for the conduct of scooping reviews. *JBI Evidence Synthesis*, *18*(10), 2119–2126. https://doi.org/10.11124/JBIES-20-00167

Phillips, A. L., & Anderson, A. (2020). Cyberbullying, digital citizenship, and youth with autism: LIS education as a piece in the puzzle. *The Library Quarterly*, *90*(3), 264–282. https://doi.org/10.1086/708957

Raghavendra, P., Hutchinson, C., Grace, E., Wood, D., & Newman, L. (2018). "I like talking to people on the computer": Outcomes of a home-based intervention to develop social media skills in youth with disabilities living in rural communities. *Research in Developmental Disabilities*, *76*, 110–123. https://doi.org/10.1016/j.ridd.2018.02.012

Raghavendra, P., Newman, L., Grace, E., & Wood, D. (2015). Enhancing social participation in young people with communication disabilities living in rural Australia: Outcomes of a home-based intervention for using social media. *Disability and Rehabilitation*, *37*(17), 1576–1590. https://doi.org/10.3109/09638288.2015.1052578

Robertson, S. M. (2013). *Online and offline bullying of autistic youth: Anti-bullying strategies, reporting, and technological solutions*. The Pennsylvania State University.

Rocheleau, J. N., & Chiasson, S. (2022). Privacy and safety on social networking sites: Autistic and non-Autistic teenagers' attitudes and behaviors. *ACM Transactions on Computer-Human Interaction*, *29*(1), 1–39. https://doi.org/10.1145/3469859

Sciberras, E., Ohan, J., & Anderson, V. (2012). Bullying and peer victimisation in adolescent girls with attention-deficit/hyperactivity disorder. *Child Psychiatry and Human Development*, *43*(2), 254–270. https://doi.org/10.1007/s10578-011-0264-z

Shelton, N., Munro, N., Keep, M., Starling, J., & Tieu, L. (2023). Do speech–language therapists support young people with communication disability to use social media? A mixed methods study of professional practices. *International Journal of Language & Communication Disorders*, *58*(3), 848–863. https://doi.org/10.1111/1460-6984.12826

Shelton, N., Munro, N., Starling, J., Tieu, L., & Keep, M. (2024). Social media use by young people with language disorders: A scoping review. *Disability and Rehabilitation*, *46*(26), 6240–6250. https://doi.org/10.1080/09638288.2024.2325039

Sullivan, T. N., Sutherland, K. S., Farrell, A. D., Taylor, K. A., & Doyle, S. T. (2017). Evaluation of violence prevention approaches among early adolescents: Moderating effects of disability status and gender. *Journal of Child and Family Studies*, *26*(4), 1151–1163. https://doi.org/10.1007/s10826-016-0629-9

Touloupis, T., & Athanasiades, C. (2022). Cyberbullying and empathy among elementary school students: Do special educational needs make a difference? *Scandinavian Journal of Psychology*, *63*(6), 609–623. https://doi.org/10.1111/sjop.12838

Wehmeier, P. M., Schacht, A., & Barkley, R. A. (2010). Social and emotional impairment in children and adolescents with ADHD and the impact on quality of life. *The Journal of Adolescent Health*, *46*(3), 209–217. https://doi.org/10.1016/j.jadohealth.2009.09.009

World Health Organisation (WHO). (2023). *Adolescent health*. World Health Organisation. Retrieved September 9 2023 from https://www.who.int/health-topics/adolescent-health#tab=tab_1

Wright, M. F. (2017). Parental mediation, cyber victimization, adjustment difficulties, and adolescents with autism spectrum disorder. *Cyberpsychology: Journal of Psychosocial Research on Cyberspace*, *11*(1), 1–6. https://doi.org/10.5817/CP2017-1-6

Wright, M. F. (2018). Cyber victimization and depression among adolescents with autism spectrum disorder: The buffering effects of parental mediation and social support. *Journal of Child & Adolescent Trauma*, *11*(1), 17–25. https://doi.org/10.1007/s40653-017-0169-5

Zych, I., Ortega-Ruiz, R., & Del Rey, R. (2015). Systematic review of theoretical studies on bullying and cyberbullying: Facts, knowledge, prevention, and intervention. *Aggression and Violent Behavior*, *23*, 1–21. https://doi.org/10.1016/j.avb.2015.10.001