

Assessment and Diagnostic Practices for Autism Spectrum Disorders: A Survey of Clinicians in Canada

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Keywords

assessment
autism spectrum disorders
Canadian clinicians
best practice
school aged diagnosis

Abstract

Timely assessment for Autism Spectrum Disorders (ASD) is essential for a comprehensive understanding of child functioning, advising diagnosis, and informing individualized treatment, but many children with milder symptoms of ASD are not diagnosed until they reach school age. American and Australian studies have identified disparities between best practice guidelines and actual clinical procedures for ASD assessment and diagnosis. At the time of this study, no research had been conducted examining school-aged ASD diagnostic practices in Canada. The primary objectives of this study were to understand clinicians' knowledge and practices in screening and assessing ASD in school-aged children, compare clinicians' reports of assessment practices to best practice guidelines, and identify assessment challenges. Eighty-six clinicians completed a web-based survey and reported that assessing comorbidities, organizing teams, and identifying ASD in children with milder symptomology were significant challenges. Findings also suggested disparities between reported practice and best practice guidelines in terms of processes implemented and inter-professional consultation practices. Overall, this study provides a snapshot

of the current context of assessment and diagnosis for Canadian school-aged children. The findings may suggest training and policy implications, and barriers identified may inform Canadian-specific guidelines for school age children that may alleviate challenges in the diagnostic process.

Introduction

Autism Spectrum Disorders (ASD) are pervasive, childhood-onset, neurodevelopmental disorders characterized by social interaction and communication deficits, and stereotyped or repetitive behaviours (American Psychiatric Association, 2013) impacting education, relationships and quality of life outcomes for children (Lee et al., 2008). Current estimates indicate that approximately 1 in 66 children in Canada (Ofner et al., 2018) and 1 in 68 children in the United States (US) (Centers for Disease Control and Prevention [CDC], 2014) have an ASD but the prevalence for school-aged children may be higher (Daniels & Mandell, 2014). As a result, undiagnosed school-aged children with ASD may not be receiving timely and meaningful intervention. To our knowledge, research describing the practices of Canadian clinicians as applied to school-aged children and comparing actual ASD assessment practices to best practice guidelines are absent from the literature. Best practice in ASD assessment requires an approach whereby “specific measures and the whole assessment process should be carefully tied to the most recent professional literature based on evidence-based evaluation of the measures and procedures” (Perry et al., 2001, p. 63). In other words, best practice is the practical application of evidence-based practices within specific organizational contexts (Driever, 2002), such as in schools, community and clinical settings. Best practice guidelines, therefore, provide an overview and summary of relevant research and recommend general and specific practical approaches connected to the research findings. Our aim was to document Canadian clinicians’ procedures and challenges to ASD screening, assessment, and diagnosis and adherence to relevant best practice guidelines to elucidate potential training, professional development, and policy implications.

ASD in School Aged Children

Although children with more severe ASD symptoms or early language delays (previously referred to as ‘low functioning’ in the literature) are often identified as early as 18 months of age, children with milder symptom severity (previously referred to as ‘high functioning’ in the literature) are often identified later in their lives because they often present with average or above average language and cognitive skills, and more subtle social and behavioral impairments (Daniels & Mandell, 2014). The lack of awareness and knowledge of symptom presentation in girls (Giarelli et al., 2010), presentation variability (Huerta & Lord, 2012), symptom overlap with other conditions (Deprey & Ozonoff, 2009), and lower socioeconomic status (Daniels & Mandell, 2014) also increase assessment complexity and may delay accurate identification of ASD. Timely diagnosis may provide a sense of relief for children and parents (Midence & O’Neill, 1999; Scorgie & Sobsey, 2000), enhance parents’ understanding of their children’s behaviours, facilitate social support to improve parent coping, enable access to evidence-based intervention (Fiske et al., 2014) to improve child outcomes, and may decrease the risk for developing comorbid mental health disorders in children with ASD (Deprey & Ozonoff, 2009).

Best Practice Guidelines

Research in Australia and the US has identified diversity in clinician knowledge, skills, and experience for ASD assessment, and deviations from existing best practice guidelines (Aiello et al., 2017; Allen et al., 2008; Taylor et al., 2016; Ward et al., 2016). *Canadian Best Practice Guidelines* and some provincial guides (see Dua, 2003) are available to guide ASD diagnostic

practices for 0-5-year-olds (Nachshen et al., 2008), but national and regional guidelines for Canadian school-aged children have yet to be developed (Chawarska et al., 2014), despite the increased demand to assess those not diagnosed prior to school age (CDC, 2014).

Best practice guidelines for screening and assessing ASD in school-aged children in the US and the United Kingdom (Filipek et al., 2000; National Collaborating Centre for Women's and Children's Health [NCC-WCH], 2011; Volkmar et al., 2014) are available. Information from these three documents plus the *Canadian Best Practice Guidelines* (Nachshen et al., 2008) provided the foundational information to inform the present study.

All four best practice guidelines provide general procedural and practical recommendations for clinical settings. The guidelines recommend screening if there is a genetic predisposition or signs of ASD are apparent (Filipek et al., 2000; National Collaborating Centre for Women's and Children's Health, 2011; Nachshen et al., 2008; Volkmar et al., 2014). The guidelines also state that clinicians must seek information about the purpose and psychometric properties of various screening and diagnostic instruments so they can choose the appropriate tool for assessment. All four guidelines recommend using standardized tools alongside the diagnostic criteria outlined in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; APA, 2013) and/or the International Classification of Diseases (ICD-10; World Health Organization, 1992), other tools and clinical judgement (Stoesz et al., 2011).

The guidelines recommend that clinicians be trained to diagnose ASD before conducting actual assessments (Nachshen et al., 2008). Further, comprehensive assessments to measure children's skills, behaviours, knowledge, and personalities across multiple domains and settings to identify specific difficulties, assess for comorbidities, and rule out other explanations for the presenting difficulties are recommended (Nachshen et al., 2008). Experienced clinicians may vary their test batteries depending on the context and their clinical judgment (Sattler, 2008). All four best practice guidelines recommend the involvement of various professionals to ensure comprehensive information is collected and used during diagnostic decision making. The NCC-WCH further recommends that assessment teams should (at minimum) include a pediatrician or adolescent psychiatrist, a clinical or school psychologist, and a speech-language pathologist. To summarize, all four best practice guidelines share five common components and recommend (1) consultation with other professionals, (2) use of assessment tools alongside DSM or ICD diagnostic criteria, (3) involvement in assessment teams, (4) inclusion of comorbidity assessment, and (5) differential diagnosis.

The Present Study

Given that many clinicians in regions outside of Canada use diverse ASD diagnostic practices that diverge from best practice guidelines (Aiello et al., 2017; Allen et al., 2008; Taylor et al., 2016; Ward et al., 2016) and similar Canadian-based research is not available, we distributed a web-based survey to clinicians to gain a better understanding of their diagnostic practices for ASD in school-aged children in Canada. The primary objectives of the present study were to understand clinicians' knowledge and practices in screening and assessing ASD in school-aged children and to compare clinicians' reports of assessment practices to best practice guidelines, including adherence to the five common components of these guidelines as listed above. Another key objective was to gather information from clinicians to understand the challenges they have experienced that may influence adherence to five common components of the four best practice

guidelines.

Methods

Participants

School and clinical psychologists, psychiatrists, family physicians, and clinicians from various disciplines who are part of teams (including those making decisions under supervision) involved in the assessment and diagnosis of ASD in school-aged children were eligible to participate in the survey. Responses were collected from 97 clinical and school psychologists, pediatricians, and family physicians from September to December 2017.

Materials and Procedures

Our survey was adapted from two existing surveys (Allen et al., 2008; Ward et al., 2016) and included questions about clinician training, assessment methods, tools used, and adherence to best practice guidelines based on their past year of practice. The study advertisement was distributed by 2 national and 11 local organizations via email, online newsletters, and website postings. Reminder emails were also sent to members on our behalf. This research was approved by the Psychology/Sociology Research Ethics Board at the University of Manitoba.

Results

Demographics

The data from 11 participants were excluded because they did not complete any questions following consent ($n = 6$) or were ineligible to participate ($n = 5$). The data from 86 participants were analyzed (see Table 1). Thirteen participants reported their highest education level as Master's, 29 as doctoral, 16 as a medical doctor, and 16 as pediatrician. Seventy-seven participants were licensed in their practice: 34 were licensed for ≤ 10 years, 30 for 11-25 years, and 13 for > 25 years. Two participants reported licensing in progress. In Canada, some clinicians are licensed (or certified) by professional colleges, whereas other disciplines are authorized to practice by provincial education authorities. Provisionally licensed professionals may be involved in diagnosis while being supervised; thus, can be involved in assessment and diagnostic processes.

Table 1 - *Characteristics of the Sample*

Characteristic	Total ^a ($n = 86$)	Clinical Psychologists ($n = 38$)	School Psychologists ($n = 16$)	Physicians ^b ($n = 37$)
Canadian Region ^c				
Atlantic Canada	16	12	3	2
Central Canada	21	9	5	10

Western Canada	42	15	6	23
Practice Type				
Private	12	5	1	6
Public	40	15	6	20
Combined	26	15	7	8
Practice Setting ^d				
Clinic/Doctor Office	36	14	3	21
College/University	14	5	1	9
Community Mental Health	7	6	0	1
Hospital	29	8	0	21
Private Practice	31	16	7	12
School Setting	20	8	13	3

Note. Frequencies do not sum to the total sample size in each column and reflect missing data.

^aSum of n of each profession exceeds total n , as some participants selected more than one profession.

^bIncludes pediatricians and family physicians.

^cAtlantic Canada includes New Brunswick, Nova Scotia, and Prince Edward Island; Central Canada includes Ontario and Quebec; Western Canada includes British Columbia, Alberta, Saskatchewan, and Manitoba.

^dParticipants were able to select multiple response options.

Training and Experience with ASD Diagnosis

Thirty-one (36%) participants reported high levels of perceived knowledge about ASD diagnosis in school-aged children, and 5 (6%) rated their perceived knowledge as low. Similarly, 30 (35%) participants perceived their expertise in diagnosing ASD in school-aged children as high, whereas 8 (9%) reported low levels of expertise. Ratings of perceived knowledge and expertise were positively correlated, $r_s(84) = .92, p < .001$. Reading professional books or journals was the most common training method, followed by workshops and informal information from colleagues. Participants reported a median of 4 ($Mode = 3, Range = 0-8$) different training experiences. The number of different training experiences was positively correlated with ratings of perceived knowledge and expertise, $r_s(84) \geq .44, p < .001$.

Assessment Methods

Seventy (85.4%; $n = 82$) participants endorsed using at least one ASD tool in the past year (Table 2). Participants endorsed a median of 2 ($Mode = 2, Range = 0-8$) different ASD tools. There were no differences in the number of ASD tools used between professional groups ($\chi^2_H = 2.64, p = .27$) or regions ($\chi^2_H = 5.32, p = .07$). Of the participants who indicated ASD tool use ($n = 70$), 59 reported that ASD tools are useful in assessments and 45 of the 59 participants also indicated they used ASD tools due to their familiarity with them. Of those who reported not using ASD tools ($n = 12$), 8 reported the lack of knowledge and training with ASD tools as barriers to tool use.

Table 2 - *Commonly Used Screening and Diagnostic Tools for the Assessment of ASD and Frequency of Tool Use by Profession, n (%)*

ASD tool	Total (n = 82)	Clinical Psychologists (n = 36)	School Psychologists (n = 15)	Physicians ^a (n = 35)
Screening tools				
Autism Behaviour Checklist (ABC) ^b	11 (13.4)	4 (11.1)	2 (13.3)	5 (14.3)
Autism Quotient (AQ) ^c	14 (17.1)	10 (27.8)	3 (20.0)	3 (8.6)
Childhood Autism Screening Test (CAST) ^d	14 (17.1)	3 (8.3)	2 (13.3)	9 (25.7)
Checklist for Autism in Toddlers (CHAT) ^e	24 (29.3)	6 (16.7)	2 (13.3)	17 (48.6)
Gilliam Autism Rating Scale (GARS-3) ^f	12 (14.6)	8 (22.2)	2 (13.3)	3 (8.6)
Social Communication Questionnaire (SCQ) ^g	28 (34.1)	16 (44.4)	6 (40.0)	8 (22.9)
Diagnostic tools				
Autism Diagnostic Interview- Revised (ADI-R) ^h	41 (50.0)	22 (61.1)	7 (46.7)	15 (42.9)
Autism Diagnostic Observation Schedule (ADOS) ⁱ	43 (52.4)	22 (61.1)	5 (33.3)	18 (51.4)
Childhood Autism Rating Scale (CARS) ^j	19 (23.2)	10 (27.8)	4 (26.7)	7 (20.0)
Do not use any tools	12 (14.6)	2 (5.6)	1 (6.7)	9 (25.7)

Note. Sample sizes of each profession may not equal to total *n* due to some participants reporting more than one profession.

^aIncludes pediatricians and family physicians.

^bKrug et al., 1980

^cBaron-Cohen et al., 2001

^dFormerly the Childhood Asperger Syndrome Test, CAST; Scott et al., 2002

^eBaron-Cohen et al., 1996

^fGilliam, 2013 ^gRutter, Bailey, et al., 2003; formerly the Autism Screening Questionnaire [ASQ]; Berument et al., 1999.

^hRutter, Le Couteur, et al., 2003

ⁱLord et al., 1999

^jSchopler et al., 1988

Twenty-seven (31%) participants *always* consulted with other professionals in assessments for ASD, no participants reported *never* consulting with other professionals during ASD assessments, and there were no differences in this rating between professional groups ($\chi^2_{H} = 2.37, p = .31$) or Canadian regions, $\chi^2_{H} = 4.90, p = .09$. Regardless of profession or region, participants reported seeking assistance from a median of 4 (*Mode* = 2, *Range* = 1-10) different types of professionals within the past year $\chi^2_{H} \leq 3.82, p \geq .15$. See Table 3.

Table 3 - *Frequencies for the Types of Professionals Consulted During ASD Assessments*
(*N* = 86)

Type of Professional Consulted	<i>n</i>	%	Profession of Participant
Speech-language Pathologist	52	59.8	Clinical Psychologist, School Psychologist, Pediatrician
K-12 Education Teacher	33	37.9	Clinical Psychologist, School Psychologist, Pediatrician, Family Physician
Special Education Teacher	32	36.8	Clinical Psychologist, School Psychologist, Pediatrician
Occupational Therapist	30	34.5	Clinical Psychologist, School Psychologist, Pediatrician
Clinical Psychologist	29	33.3	Clinical Psychologist, School Psychologist, Pediatrician
School Psychologist	25	28.7	Clinical Psychologist, School Psychologist, Pediatrician, Family Physician

Pediatrician	25	28.7	Clinical Psychologist, School Psychologist, Pediatrician, Family Physician
Psychiatrist	20	23	Clinical Psychologist, School Psychologist, Pediatrician
Family Physician	11	12.6	Clinical Psychologist, School Psychologist, Pediatrician
Applied Behaviour Analyst	6	7	Clinical Psychologist, School Psychologist, Pediatrician
Neurologist	5	5/7	Clinical Psychologist, Pediatrician, Family Physician

Note: Participants were able to select multiple response options.

Fifty-five (93.2%; $n = 59$) participants reported involvement in assessment teams. Four (6.8%) participants indicated never being part of assessment teams for six different reasons, including logistical difficulties within their clinic ($n = 1$), diverse training between professions ($n = 1$), extra time required ($n = 1$), vacant positions in their province ($n = 1$), a lack of knowledge in their system ($n = 1$), and/or the perception of assessment cases overload within the system ($n = 1$).

Sixty (96.8%; $n = 62$) participants reported using the DSM-5, five reported using the DSM-IV-TR, and two reported using the ICD-9 or ICD-10 during assessments. Many participants *always* use differential diagnosis in ASD assessments (67%) and collect teacher reports (52%), and *sometimes* use observation in classrooms (52%) and multiple settings (40%) (Table 4 – page 9). No differences across Canadian regions in the use of the specific assessment information were found (Kruskal-Wallis, $p > .05$ for all comparisons) but significant differences across professional groups did emerge (Table 5 – page 10). For example, physicians administered physical examinations and clinical and school psychologists did not; however, physicians used information from behaviour questionnaires, cognitive measures and intelligence measures less often than do clinical and school psychologists.

Table 4 - *Frequency with which Additional Sources of Information are used in Assessments, n (%)*

Information Source (in alphabetical order)	<i>n</i>	Never	Sometimes	About half of the time	Most of the time	Always
Adaptive Behaviour Questionnaire	58	6 (10)	10 (17)	10 (17)	18 (31)	14 (24)
Behaviour Rating Scale	55	17 (31)	17 (31)	5 (9)	9 (16)	7 (13)
Cognitive Measure	58	4 (7)	14 (24)	8 (14)	18 (31)	14 (24)
Comorbid Assessment	55	4 (7)	11 (20)	4 (7)	17 (31)	19 (35)
Developmental Questionnaire	55	8 (15)	10 (18)	4 (7)	14 (26)	19 (35)
Differential Diagnosis	58	0 (0)	3 (5)	5 (9)	11 (19)	39 (67)
Intelligence Measure	60	4 (7)	15 (25)	6 (10)	23 (38)	12 (20)
Language Assessment	59	5 (9)	14 (24)	10 (17)	19 (32)	11 (19)
Observation in Classroom	60	8 (13)	31 (52)	5 (8)	6 (10)	10 (17)
Observation in Multiple Settings	57	14 (25)	23 (40)	3 (5)	9 (16)	8 (14)
Teacher report	60	1 (2)	5 (8)	3 (5)	20 (33)	31 (52)
Physical Examination	59	21 (36)	6 (10)	3 (5)	10 (17)	19 (32)

Table 5 - Comparisons of Use of Additional Assessment Information Between Professions

Information	Kruskal-Wallis χ^2			Mann-Whitney U								
	H	df	p	Clinical Psychologist vs. Medical Doctor			Clinical Psychologist vs. School Psychologist			Medical Doctor vs. School Psychologist		
				U	MRD	p	U	MRD	p	U	MRD	p
Adaptive Behaviour Questionnaire	16.30	2	< .001*	100.5	15.6	< .001*	97.50	4.5	.26	59.50	-7.4	.04
Behaviour Rating Scale	12.49	2	.002*	135.0	11.9	.002*	86.00	-2.9	.49	29.00	-9.5	.006
Cognitive Measure	25.78	2	< .001*	82.5	17.7	< .001*	86.00	-5.25	.21	13.50	-13.4	< .001*
Comorbid Assessment	1.67	2	.43									
Developmental Questionnaire	8.71	2	.01*	229.0	3.08	.42	52.50	-7.9	.03	34.50	-10.7	.003*
Differential Diagnosis	0.83	2	.66									
Intelligence Measure	24.65	2	< .001*	98.0	17.1	< .001*	107.00	-3.84	.35	19.50	-13.7	< .001*
Language Assessment	3.26	2	.20									
Observation in Classroom	28.96	2	< .001*	187.0	9.9	.006	14.00	-16.6	< .001*	7.50	-15.4	< .001*
Observation in Multiple Settings	13.23	2	.001*	227.5	4.9	.19	36.00	-12.1	.001*	28.50	-11.0	.001*
Teacher report	4.57	2	.102									
Physical Examination	35.90	2	< .001*	36.0	-21.6	< .001*	109.50	-2.17	.58	13.00	15.2	< .001*

Note. Mann-Whitney comparisons were conducted for significant omnibus results (Kruskal-Wallis at $\alpha = .05$). *A Bonferroni correction was applied such that values of U are significant at $\alpha = .004$. MRD = Mean Rank Difference, subtracts the mean rank of group 1 from the mean rank of group 2.

Adherence to Best Practice Guidelines

Fifty (83.3%; $n = 60$) participants indicated awareness of best practice guidelines for school-aged children, whereas 10 (16.7%) were unaware of any guidelines. As stated in the Introduction section, the four best practice guidelines share five common components: (1) consultation with other professionals, (2) use of DSM or ICD diagnostic criteria, (3) involvement in multi-disciplinary assessment teams, (4) inclusion of comorbidity assessment, and (5) differential diagnosis. Fifty-three (61.6%) participants include all five common components in their ASD assessments, 7 (8.1%) include 4 components, 2 (2.3%) include 3 components, and 24 (27.9%) did not include any components. Consultation with other professionals was the most frequently adhered to component, whereas involvement in teams was the least frequent (see Table 6).

Differences in the adherence to the five components between professional groups, $\chi^2(2, N = 86) = 1.59, p = .45$, or regions $\chi^2(2, N = 77) = 0.54, p = .76$, did not emerge. Perceived expertise scores were positively associated with the number of components adhered, $r_{pb}(84) = .53, p < .001$.

Table 6 - *Frequency of Use of the Five Common Components of the Four Best Practice Guidelines*^{a-d} ($N = 86$)

Component	Frequency (n)	Percent (%)
1. Consultation with other professionals	62	72.1
2. Inclusion of comorbidity assessment	61	70.9
3. Inclusion of differential diagnosis	61	70.9
4. Use of Assessment Tools alongside DSM or ICD criteria	60	69.8
5. Involvement in assessment teams	55	64

^a Filipek et al., 2000 ^b National Collaborating Centre for Women's and Children's Health, 2011

^c Nachshen et al., 2008 ^d Volkmar et al., 2014

Challenges

The primary challenges in ASD diagnosis involved the presence of comorbidities and difficulties identifying children with milder symptom severity and noticing that colleagues confuse ASD for other conditions (Table 7). Less common challenges included a lack of access to other clinicians

for collaboration ($n = 5$), specific tools and professional development opportunities ($n = 4$), pressure from parents or schools to diagnose ($n = 2$), and long assessment waitlists ($n = 2$). Participants also identified that their colleagues note challenges in identifying ASD in girls ($n = 4$), long assessment waitlists ($n = 2$), concerns related to culturally appropriate assessments ($n = 1$), and the lack of resources ($n = 1$) and knowledge about biological causes of ASD ($n = 1$).

Table 7 - *Challenges Diagnosing Autism Spectrum Disorders (ASD) Identified by Participants (N = 86)*

Challenge	Personal		Field	
	<i>n</i>	%	<i>n</i>	%
Comorbidities	37	43.0	44	51.2
Confusion with another disability	28	32.6	54	62.8
Difficulties organizing an assessment team	14	16.3	16	18.6
Difficulties identifying ASD in high functioning children	32	37.2	45	52.3
Lack of training/knowledge about ASD, in general	9	10.5	31	36.0
Lack of training/knowledge about best practice guidelines for diagnosis of ASD	12	14.0	34	39.5
Lack of training/knowledge about ASD assessment tools	13	15.1	33	38.4

Note. Participants were able to select multiple response options.

Discussion

We examined and compared Canadian clinician-reported practices to best practice guidelines for screening, assessing and diagnosing school-aged children suspected of having an ASD to understand challenges in assessment practices in Canada. Many surveyed clinicians implement important best practice components at least some of the time, however, similar to findings in other countries (Aiello et al., 2017; Allen et al., 2008; Taylor et al., 2016; Ward et al., 2016), evidence of disparity between best practice guidelines and reported practice, particularly with regards to ASD-tool use, consultation and team approaches and gathering additional information was apparent.

Adherence to Best Practice Guidelines

Although the majority of clinicians reported awareness of existing best practice guidelines for ASD, some clinicians reported being unaware of any guidelines, suggesting that greater promotion of the guidelines for ASD assessment is required. This is unfortunate, as the ‘gold standard’ in assessment and diagnosis of ASD necessitates adherence to the recommendations in the four guideline documents, including adherence to DSM criteria (Perry et al., 2001) and consulting qualified multi-disciplinary teams (e.g., Falkmer et al., 2013). Despite this, most of the surveyed clinicians reported a high level of knowledge and expertise regarding ASD diagnosis, suggesting that many Canadian clinicians feel generally competent assessing and diagnosing ASD (contrasting Aiello et al., 2017). Based on their professional judgement, clinicians may also feel that including all five common components of the four best practice guidelines (especially the use of certain tools alongside DSM or ICD criteria or multi-disciplinary consultations) is unnecessary in situations of time-sensitive assessments, obvious symptomology, and/or professional competence, which may explain limited component adherence. More research is required to clarify the reasons for lack of adherence to best practice recommendations.

We also found links between perceived expertise, adherence to the five best practice components, and training, aligning with literature indicating that ASD specific training is key to conducting evidence-based ASD assessments (Aiello et al., 2017). The growing number of referrals for ASD (CDC, 2014) likely increase experience with diagnostic assessments, thereby increasing exposure to various clinical presentations and contributing to a greater sense of competency. Factors that lead to changes in perceived ASD knowledge and expertise over time and how perceived competence influences practice should be examined further.

Although some best practice guideline documents identify appropriate ASD measures, no specific battery or test is required to align assessment and diagnosis with best practice standards and no single measure is required for best practice in assessment and diagnosis. However, many surveyed clinicians indicated specific tools they used to gather and quantify information about specific symptomology. A large proportion of clinicians use specific tools (i.e., Autism Diagnostic Observation Schedule [ADOS or the updated ADOS-2], Lord et al., 2012; Autism Diagnostic Interview-Revised [ADI-R], Rutter, Couteur et al., 2003) for ASD assessment (contrasting Aiello et al., 2017; Allen et al., 2008). Many of these clinicians reported that they chose these tools because provincial policies (e.g., Autism Community Training Society, 2012) required them to use specific tests to facilitate access to funding and services. Interestingly, several clinicians reported not using ASD tools during assessment for ASD because they lack the knowledge/training to use them. Thus, increased information about available ASD assessment tools and guidance for choosing appropriate tools may improve rates of ASD tool use.

Limited use of multiple sources of information to understand a child (in contrast to acknowledged assessment guidelines; Sattler, 2008) were also reported, and varied widely between professions. Directly comparing the uptake of specific ASD tools and other sources of information between and within countries and across disciplines is an important avenue for future research to clarify the reasons for limited assessment source use.

In line with best practice guidelines, most surveyed clinicians consulted other professionals during the assessment process; however, fewer than half consulted with professionals in disciplines other than their own, highlighting a gap between recommendations and practice. The importance of including multi-disciplinary perspectives in assessment teams is undeniable

(Falmer et al. 2013), yet assessments for ASD are rarely conducted in a multi-disciplinary team approach (Allen et al., 2008; Taylor et al., 2016). Thus, improving opportunities and system structures for teams representing varied disciplines is needed to ensure comprehensive, evidence-based assessment and diagnostic practices for ASD.

Barriers and Implications for Best Practice

Barriers to consultation/team-based approaches to ASD assessments reported by surveyed clinicians included scheduling difficulties (within/between clinics) and clinicians in some regions reported inadequate clinician numbers or chronically vacant positions. Indeed, the number of healthcare providers is highly variable across provinces and territories and many regions are underserved. For example, 2016 data for Manitoba reports 16 psychologists per 100,000, whereas the Canadian average is 49 psychologists per 100,000 (Canadian Institute of Health Research, 2018). The Canadian Paediatric Society suggests that more community-based paediatric health care providers be trained to assess and diagnose children presenting with milder symptomology or less complex cases (Brian et al., 2019). Thus, increased investment in education and healthcare systems to fill vacant positions is required to improve opportunities for team consultation. In circumstances where face-to-face assessment and consultation are not possible, “telehealth” systems (Reese et al., 2013; 2015) may be one solution for ensuring best practice in the assessment process. Future research should examine whether these methods are effective in the Canadian context, especially in areas where internet and phone communication are not reliable. Indeed, during the recent covid-19 pandemic, opportunities to implement innovative assessment methods to comply with physical distancing measures may provide us with more information about the effectiveness of these approaches.

All four best practice guidelines recommend the use of ASD assessment tools alongside DSM or ICD criteria; indeed, the administration of specific instruments is required in certain jurisdictions for the diagnoses of ASD to be considered valid. Strict adherence to such policies, however, may prevent use of other appropriate tools, inadvertently create longer waitlists (Nachshen et al., 2008), and limit access to funding and intervention. Many clinicians and researchers argue that children’s diagnoses and intervention should not be dependent upon the use of specific tools (Filipek et al., 2000; NCC-WCH, 2011; Nachshen et al., 2008; Volkmar et al., 2014), however, novice professionals may benefit from a more structured approach where specific tests or batteries of tests are integrated. There is also significant controversy with the assertion that certain instruments are more effective than others, as some have been found to under-identify children with milder ASD symptomology (Kamp-Becker et al., 2013), or over identify those with other conditions (Klein-Tasman et al., 2007). Thus, evidence-based practice requires that clinicians must use their clinical judgement and select tools based on their psychometric properties and limitations, the clinical context (e.g., geographic location), and the purpose of the assessment (Nachshen et al., 2008; Zander et al., 2016).

Similar to a Canadian survey of graduate psychology students reporting inadequate training in developmental disabilities, including ASD (Weiss et al., 2010), half of our sample indicated that training in ASD during their practicum/internship/residency was absent. This is unfortunate as practice assessing ASD during clinical training (Rodolfa et al., 2009) facilitates fluency in assessment procedures and familiarity with the clinical presentation of ASD. Consistent with research highlighting variation of the ASD spectrum and the complexity of assessing less

pronounced symptoms (Huerta & Lord, 2012), surveyed clinicians indicated that assessing children with milder symptom severity and differentiating comorbidities for accurate diagnosis were particularly challenging. Consequently, targeted training and professional development opportunities elucidating milder expression of ASD and tools to reliably identify these individuals are essential; facilitation requires that postsecondary, health, and education systems develop and implement supporting policies, funding, and programs.

Study Limitations

This study has several limitations that must be acknowledged. First, due to limited sample size, we were unable to conduct a fine-grained set of analyses comparing practices between provinces. Second, despite extensive recruitment efforts, psychiatrists did not participate in this study; this is unfortunate as psychiatrists are often involved in ASD assessments in Canadian public and private sectors (ACT, 2012; Manitoba Adolescent Treatment Centre, 2021; Ontario Ministry of Children and Youth Services, 2016). Third, clinicians from Canadian territories did not participate in this study, which may reflect recruitment difficulties and/or low numbers of eligible clinicians living and practicing in those regions. Future research should recruit clinicians in Canada's territories as practices and access may differ considerably from the provinces.

Another limitation of our survey is that we did not probe deeper into the reasons for using or not using specific tools and/or whether clinicians felt empowered to overcome these challenges (e.g., requesting release time for additional training to administer tests; purchase requests for specific commercially available instruments). Future research could examine these questions to understand clinicians' familiarity, decision making processes, use and the barriers they experience regarding specific standardized instruments.

Conclusions

Despite relatively good adherence to best practice guidelines by clinician report, we found disparities between recommended and actual practice in terms of frequency of consultation, team-based approaches, and additional assessment information collected and utilized. Clinicians reporting high levels of expertise were more likely to implement the five common components of the four best practice guidelines. Given the link between training and perceived expertise, ASD specific training and professional development opportunities are one clear opportunity for improving best practice in Canada. Identification of limits and barriers to team consultation and collaboration, training, and professional development may point to potential opportunities for policy and funding changes to improve practice, and consequently, facilitate more timely assessment, diagnosis, and service provision for school-aged children with ASD in Canada. Finally, there are currently no national best practice guidelines for ASD assessment in school-aged children with milder symptomology in Canada. If and when specific guidelines for this subpopulation of children are developed, information pertinent to those with milder ASD symptomology, female presentation, differential and comorbidity assessment, and appropriate tools for school-aged populations should be included.

Key Messages from this Article

People with disabilities: If you struggle in some areas of your life, you deserve to get the help you need when you need it from people who are trained to help.

Professionals: Involvement in more training and professional development opportunities to increase familiarity with the complexity of an Autism Spectrum Disorder (ASD) diagnosis may improve competency with autism assessment and adherence to evidence-based practice standards.

Policy makers: Changes in policies and additional funding for training and professional development opportunities for clinicians involved in the assessment for ASD in school-aged children are necessary to promote timely and accurate diagnoses in Canada.

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