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Assessment and Diagnostic Practices Relating to Autism Spectrum Disorder in the United States and Mexico

Abstract

Purpose: The present study examined and compared professional assessment and diagnostic practices relating to autism spectrum disorder (ASD) in Mexico and the United States (U.S.). This information is of great importance because there is an extremely limited amount of information pertaining the assessment and diagnostic practices for ASD in Mexico and little is known about how these practices compare to those in the U.S. Methods: Archival data from a survey investigating ASD in the U.S. and Mexico was used for this study. Participants included 29 professionals from the U.S. and 7 professionals from Mexico. Professionals were from a variety of different occupations, but all reported to be involved in the diagnosis of ASD. Results: In both Mexico and the U.S., most professionals reported use of similar ASD related assessment and diagnostic practices, and ASD related assessment and diagnostic practices were frequently in alignment with current best practices recommendations. However, there were professionals from both Mexico and the U.S. that reported use of diagnostic tools and practices that did not adhere to recommendations, such as, use of outdated versions of the DSM, diagnosis of ASD individually, and evaluation of individuals in one setting. Conclusion: An understanding of the assessment and diagnostic practices currently being used in Mexico and in the U.S. provides both researchers and clinicians with a better understanding of what is being implemented by different professionals. Additionally, an understanding of the assessment and diagnostic practices for ASD in Mexico is of particular importance for professionals practicing in the U.S. as most immigrants in the U.S are from Mexico therefore it is likely professionals in the U.S. will encounter patients on their caseloads that received diagnoses of ASD in Mexico.

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Ralph Carlson, Ph.D. is a full professor at UTRGV. Dr. Carlson has held various university level positions and was the recipient of the Fulbright Senior Scholar to Brazil in Psychology-Quantitative Science in 2002-2003. Dr. Carlson has multiple publications, and he has presented at numerous local, state, national, and international conferences.

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ABSTRACT

Purpose: The present study examined and compared professional assessment and diagnostic practices relating to autism spectrum disorder (ASD) in Mexico and the United States (U.S.). This information is of great importance because there is an extremely limited amount of information pertaining the assessment and diagnostic practices for ASD in Mexico and little is known about how these practices compare to those in the U.S. **Methods:** Archival data from a survey investigating ASD in the U.S. and Mexico was used for this study. Participants included 29 professionals from the U.S. and 7 professionals from Mexico. Professionals were from a variety of different occupations, but all reported to be involved in the diagnosis of ASD. **Results:** In both Mexico and the U.S., most professionals reported use of similar ASD related assessment and diagnostic practices, and ASD related assessment and diagnostic practices were frequently in alignment with current best practices recommendations. However, there were professionals from both Mexico and the U.S. that reported use of diagnostic tools and practices that did not adhere to recommendations, such as, use of outdated versions of the DSM, diagnosis of ASD individually, and evaluation of individuals in one setting. **Conclusion:** An understanding of the assessment and diagnostic practices currently being used in Mexico and in the U.S. provides both researchers and clinicians with a better understanding of what is being implemented by different professionals. Additionally, an understanding of the assessment and diagnostic practices for ASD in Mexico is of particular importance for professionals practicing in the U.S. as most immigrants in the U.S are from Mexico therefore it is likely professionals in the U.S. will encounter patients on their caseloads that received diagnoses of ASD in Mexico.

Keywords: autism spectrum disorder, assessment, diagnosis, Mexico, United States

INTRODUCTION

Autism Spectrum Disorder

Autism spectrum disorder (ASD) is a neurodevelopmental disorder characterized by deficits in social interaction and communication and restricted and/or repetitive behaviors.[1] The Diagnostic and Statistical Manual of Mental Disorders (DSM) is one of the most common tools used to classify and diagnose ASD worldwide.[2] The most current version of the DSM was published in 2013 (DSM-5). In this version, many changes were made to how ASD is classified and diagnosed. For example, ASD is no longer classified under the category "pervasive developmental disorders," and ASD is listed as a single diagnosis. Additionally, the diagnosis of Asperger's and pervasive developmental disorder, not otherwise specified (PDD-NOS) are no longer present. Another change in the classification of ASD that was included in the DSM-5 is that practitioners are to specify the following in relation to ASD: 1) severity level, 2) if present with or without intellectual impairment, 3) if present with or without accompanying language impairment, 4) if associated with another neurodevelopmental, mental, or behavioral disorder, 5) if ASD is occurring with catatonia, and 6) if ASD is associated with a known medical or genetic condition or environmental factor.[1] The major changes in the classification of ASD in the DSM-5 were published more than eight years ago. Few studies have explored if these changes are being implemented and if these changes have impacted the assessment and diagnostic practices for ASD. The purpose of the current study will be to explore the current assessment and diagnostic practices for ASD in Mexico and how these practices compare to those in the U.S.

Prevalence of ASD

ASD was first identified in the literature in 1943 by Leo Kanner.[3] At that time, the prevalence rate was about 4-5 in 10,000 individuals. The prevalence of ASD in the U.S. has increased considerably. In the last few years, the prevalence of ASD in children changed from 1 in 59 children to 1 in 44 children.[4-5] According to the CDC (2020), boys are 4 times more likely to receive a diagnosis of ASD than females and Hispanic children in the U.S. are less likely to receive a diagnosis of ASD than non-Hispanic White and non-Hispanic Black children.[5]

While we know the prevalence rate of ASD in the U.S., in Mexico, the prevalence rate of ASD is unknown.[6] Estimates for the prevalence rate of ASD in Mexico have ranged from 1.43 per 1,000 to 1 in 115 individuals.[7-8] The scarcity of information pertaining to the prevalence of ASD in Mexico has been attributed to limitations in consistent and systematic tracking of ASD and variability in identification procedures throughout the country.[9]

ASD Assessment and Diagnostic Practices in the U.S.

The assessment and diagnosis process for ASD in the U.S. has been well studied. Current recommendations for the assessment and diagnosis of ASD in the U.S. include an evaluation(s) conducted by a multidisciplinary team of professionals and use of the DSM-5.[10] It is also recommended that multiple assessment tools should be used when diagnosing ASD and that these tools should rely on two sources of information: 1) the parents' or caregivers' descriptions of the child's development and 2) a professional's observation.[10] The current "gold standard" assessment tools to be used for the diagnosis of ASD are the Autism Diagnosis Interview-Revised (ADI-R) and the Autism Diagnostic Observation Schedule, Second Edition (ADOS-2). Examples of additional assessments that can be used when diagnosing ASD include the Childhood Autism Rating Scale, Second Edition (CARS-2) and the Gilliam Autism Rating Scale, Third Edition (GARS-3).[11-14]

ASD Assessment and Diagnostic Practices in Mexico

In Mexico, little information is available pertaining to ASD assessment and diagnosis. ASD can be diagnosed by a family doctor, a medical psychiatrist, or a developmental psychiatrist with primary focus on infants and adolescents.[15] Additionally, it is recommended that two systems be used to classify and diagnose ASD including: 1) the most recent and revised version of the DSM and 2) the World Health Organization (WHO) manual. Few studies have been conducted exploring ASD diagnostic practices in Mexico.[15]

A study conducted by Harris and Barton found that healthcare practitioners in Mexico continue to use the DSM-IV-TR when diagnosing ASD and that psychologists are the most common healthcare provider to diagnose ASD followed by medical doctors.[6] This study also found that most children in Mexico received a diagnosis of ASD at a later age than children in other countries.[6] Bravo Oro and colleagues found that in Mexico, families of individuals suspected of having ASD are often referred to specialized clinics where neuropsychologists conduct diagnostic assessments in conjunction with other professionals when necessary. In addition, Bravo Oro and colleagues found that professionals in Mexico often use the DSM-IV-TR for diagnostic purposes along with the M-CHAT, CARS, ADOS, and ADI-R screening and diagnostic assessments.[16.] There is a need for more studies exploring the ASD diagnostic practices in Mexico.

Purpose

While there is much that we know about the diagnosis of ASD in the U.S., little is known about how ASD is diagnosed in Mexico. According to the U.S. Census Bureau 2019 data, 18.5% of the U.S. population currently identifies as Hispanic and most Hispanic individuals in the U.S. identify as Mexican.[17] Given the large population of Hispanic individuals from Mexico in the U.S., it is likely that professionals practicing in the U.S. will provide services to individuals diagnosed with ASD in Mexico. Therefore, it is imperative that we understand the diagnostic practices being used in Mexico and understand how they compare to those in the U.S. The purpose of the present study is to investigate the assessment and diagnostic practices for ASD currently being implemented in Mexico and in the U.S. More specifically, the following research questions will be addressed:

1. What are the current processes being used to assess and diagnose individuals with ASD in Mexico and in the U.S.?
2. How do the assessment and diagnostic processes for ASD in Mexico compare to those in the U.S.?

METHODS

Data

Archival data from a survey exploring the knowledge, screening, and diagnostic practices relating to ASD was used for the current study. For this study, demographic data, and data from the diagnostic practices portion of the survey was utilized. The diagnostic practices section of the survey included a total of 17 multiple choice and fill in the blank questions. This section of the survey only applied to participants that have participated in ASD diagnostic practices. The following questions were asked on this portion of the survey:

- Are you involved in the diagnostic process for ASD?
- Approximately how many children do you evaluate for ASD a month?
- How are children most commonly referred for evaluation for ASD?
- In your country, do current recommendations for ASD diagnostic evaluations include evaluations conducted by a multidisciplinary or transdisciplinary team of healthcare professionals?
- Do you diagnose ASD individually or in a multidisciplinary team?
- Do you observe children in multiple settings?
- Where do you conduct your assessment of ASD? Select all that apply.
- What healthcare professionals are typically involved when evaluating for ASD? Select all that apply.
- Which of these diagnostic tools do you currently use to diagnose ASD? Select all that apply.
- Is the diagnostic tool(s) that you currently use validated or standardized for English speaking individuals?
- Is the diagnostic tool(s) that you currently use validated or standardized for Spanish speaking individuals?
- If not, what precautions, modifications, or additional considerations do you implement when diagnosing the child?
- How often do you seek other health care professionals to aid in evaluating the individual with ASD?
- Which of the following do you currently use to diagnose ASD (select all that apply)?
- How long does your diagnosis process take?
- Are parents involved in the diagnostic process?
- When a child receives a diagnosis of ASD, where do you refer them? Select all that apply.

Participants

In the U.S., a total of 29 participants indicated that they participated in diagnostic practices associated with ASD. This included 19 speech-language pathologists, 7 psychologists, 1 teacher, 1 psychiatrist, and 1 board certified behavior analyst (BCBA). In Mexico, a total of 7 participants indicated that they participated in diagnostic practices associated with ASD. This included 2 pediatricians, 2 psychologists, 2 speech-language pathologists, and 1 neuropsychologist (See table 1 for demographic information).

Below is a list of inclusion criteria used for the study:

1. Licensed professional in one of the following fields: general medicine, pediatrics, neurology, psychiatry, neuropsychology, psychology, early childhood education, education, counseling, speech-language pathology, occupational therapy, and behavior analysis.
2. Current Practice in Mexico or the U.S.
3. Assess and/or diagnose or participate in the assessment and/or diagnostic processes for individuals with ASD in their practice.

Table 1. Participant demographic information.

	U.S. n=29	Mexico n=7
Gender (M, F)	2, 27	1, 6
Age		
20-30 years	6	5
31-40 years	8	1
41-50 years	7	1
50+ years	8	
Education		
Bachelor's degree	0	3
Master's degree	17	3
Ph.D.	7	0
M.D.	1	1
PsyD	4	0
Years of Experience		
0-5 years	6	4
5-10 years	4	1
10-15 years	6	2
15-20 years	7	0
>20 years	6	0

Note. Ph.D.=Doctor of Philosophy; M.D.=Doctor of Medicine; PsyD=Doctor of Psychology.

RESULTS

For the purposes of the current study, the authors only analyzed answers to survey questions that directly related to the following research questions: 1) what are the processes currently being used to assess and diagnose individuals with ASD in Mexico and in the U.S. and 2) how do the assessment and diagnostic processes for ASD in Mexico compare to those in the U.S.? Due to the small sample size of this initial study and the descriptive nature of the data, results were analyzed using counts and frequencies. Please see table 2 for a detailed representation of the results.

Assessment and Diagnosis of ASD in Mexico and the U.S.

Referral Source

The most frequently reported referral source by professionals practicing in Mexico was the parent (n=6, 86%) followed by the teacher (n=1, 14%). The most frequently reported referral source by professionals practicing in the U.S. was also the parent (n=10, 34%), followed by the pediatrician (n=7, 24%), other (n=6, 21%), a teacher (n=5, 17%), and child psychologist (n=1, 3%). Professionals from the U.S. who indicated "other" referral sources, reported the following: speech-language pathologist, care coordinators, pediatrician, birth-to-three, and child find.

Multidisciplinary Team

When asked if professionals assess and/or diagnose ASD individually or in a multidisciplinary team, 29% (n=2) of professionals practicing in Mexico reported to assess and/or diagnose ASD individually and 71% (n=5) reported to assess and/or diagnose ASD in a multidisciplinary team. Of the professionals practicing in the U.S., 14% (n=4) reported to assess and/or diagnose ASD individually, 83% (n=24) reported to assess and/or diagnose ASD with the use of a multidisciplinary team, and 3% (n=1) reported to assess and/or diagnose ASD using a method not listed, indicated as "other.' The participant indicating use of an "other" method did not indicate which method of assessment and/or diagnosis was used.

Assessment Setting(s)

When asked if multiple settings were utilized when assessing and diagnosing ASD, 29% (n=2) of professionals from Mexico reported "yes" to observing children in multiple settings, 42% (n=3) reported "no," and 29% (n=2) reported to do so only sometimes. Of the professionals practicing in the U.S., 55% (n=16) reported "yes" to observing children in multiple settings, 24% (n=7) reported "no," and 21% (n=6) reported to do so only sometimes.

When professionals were asked what assessment setting(s) they used when diagnosing and assessing individuals with ASD, the most frequently reported setting used by professionals practicing in Mexico was the medical office (n=4, 57%), followed by the home (n=1, 14%), day care (n=1, 14%), and other setting not listed (n=1, 14%). For professionals practicing in the U.S., the most frequently reported setting was "other setting not listed" (n=22, 76%), followed by the home (n=8, 28%), day care (n=8, 28%), and

the medical office (n=3, 10%). Participants in the U.S. who reported other indicated the following settings: private clinic, classroom, informal setting, formal setting for formal evaluation, speech therapy room, school office, psychologist office, rehab, clinic office, mental health office, private practice, community, program office, church, library, or wherever the family goes. It should be noted here that participants had the option to select more than one appropriate answer for this portion of the survey.

Professionals Involved in Diagnostic Process

When asked about the professionals involved in the assessment and diagnostic process, in Mexico, the most frequently reported healthcare professional involved was psychologists (n=6, 86%), followed by neurologists (n=5, 71%), speech-language pathologists (n=4, 57%), medical doctors (n=3, 43%), pediatricians (n=3, 43%), neuropsychiatrists (n=3, 43%), psychiatrists (n=2, 29%), early childhood professionals (n=2, 29%), teachers (n=2, 29%), counselors (n=1, 14%), and occupational therapists (n=1, 14%). Participants in Mexico did not indicate the participation of "other healthcare practitioners." In the U.S., the most frequently reported healthcare professional involved was also psychologists (n=26, 90%), followed by speech-language pathologists (n=18, 62%), pediatricians (n=12, 41%), early childhood professionals (n=11, 38%), teachers (n=11, 38%), occupational therapists (n=10, 34%), medical doctors (n=9, 31%), psychiatrists (n=9, 31%), other healthcare practitioners not listed (n=8, 28%), neurologists (n=5, 17%), neuropsychiatrists (n=3, 10%), and counselors (n=3, 10%). Professionals from the U.S. indicating use of 'other healthcare practitioners listed the following: diagnostician, social worker, licensed specialist in school psychology (LSSP), developmental pediatrician, board certified behavior analyst (BCBA), licensed behavior analyst (LBA), and Master of Social Work (MSW). It should be noted here that participants had the option to select more than one appropriate answer for this portion of the survey.

Diagnostic Tool(s) Used

When asked about the diagnostic tool(s) used to diagnose ASD, professionals practicing in Mexico most frequently reported use of the Childhood Autism Rating Scale (CARS; n=3, 43%), followed by the Autism Diagnostic Observation Scale-Generic (ADOS-2; n=2, 29%), other diagnostic tools not listed (n=2, 29%), the Autism Diagnostic Interview-Revised (ADI-R; n=1, 14%), the Diagnostic Interview for Social and Communication Disorders (DISCO; n=1, 14%), and the Gilliam Autism Rating Scale, Second Edition GARS-2 (n=1, 14%). Participants from Mexico indicated use of the following as other diagnostic tools: Autism Diagnostic Observation Schedule, 2nd edition (ADOS-2), the Toddler Autism Symptom Inventory (TASI), and the Adaptive Behavior Assessment System, Second Edition (ABAS-2). Furthermore, one participant indicated that there are no diagnostic tools available and reported use of the DSM-IV as an alternate method. In the U.S. the most frequently reported diagnostic tool used was the ADOS-2 (n=22, 76%), followed by ADI-R (n=14, 48%), CARS (n=10, 34%), other diagnostic tools not listed (n=10, 34%), and GARS-2 (n=8, 28%). Participants also indicated use of the following as diagnostic tools: checklists, questionnaires, interviews for pragmatics, Social Language Development Test, parent interview, teacher input, student interview, Vineland Adaptive Behavior Scales 3, the Verbal Behavior Milestones Assessment and Placement Program (VBMAPP), Children's Communication Chiecklist-2 (CCC-2), GARS-3, the Social Responsiveness Scale, Second Edition (SRS-2), Gilliam Asperger's Disorder Scale (GADS), the Social Skills Improvement System (SSIS), the Autism Spectrum Rating Scales (ASRS), and ADOS-2. It should be noted here that participants had the option to select more than one appropriate answer for this portion of the survey.

Diagnostic Criteria Used

When asked which diagnostic criteria professionals used, professionals practicing in Mexico most frequently reported criteria used was the DSM-5 (n=6, 86%) followed by the DSM-IV-TR (n=4, 57%), the World Health Organization Manual (WHO; n=2, 29%), DSM-IV (n=1, 14%), and the Mexican Public Health Services Clinical Guide (n=1, 14%). Participants in Mexico did not report the use of any other criteria. In the U.S., the most frequently reported criteria used by professionals was the DSM-5 (n=20, 69%), followed by other criteria not listed (n=7, 24%), the International Classification of Diseases, Tenth Revision (ICD-10; n=1, 3%), and DSM-IV (n=1, 3%). Participants in the U.S. who indicated the use of other criteria reported the use of the following: child psychologist, Michigan guidelines for ASD eligibility, Texas Education Agency criteria, the Wisconsin Department of Public Instruction (WI DPI) Autism checklist, and one participant reported not to be sure of what criteria was used. It should be noted here that participants had the option to select more than one appropriate answer for this portion of the survey.

Length of Assessment

For length of assessment process, 57% (n=4) of professionals practicing in Mexico reported to take 2-3 sessions for the assessment process, 29% (n=2) reported to take hours, and 14% (n=1) reported to take more than 3 sessions to assess individuals for ASD. In the U.S. 34% (n=10) reported to take hours evaluating individuals for ASD, 31% (n=9) reported to take 2-3 sessions, 24% (n=7) reported to take more than 3 sessions, and 7% (n=2) reported to take one hour.

Parent Involvement

When asked if parents were involved in the assessment and diagnostic process, 100% (n=7) of professionals practicing in Mexico reported "yes," indicating parent involvement in the diagnostic process. In the U.S., 93% (n=27) of professionals reported "yes,"

indicating parent involvement in the diagnostic process, and 7% (n=2) of professionals practicing in the U.S. reported parents were involved "sometimes."

Referral after Diagnosis

The final question addressed which referral(s) were made after a diagnosis of ASD. In Mexico, professionals most frequently reported referrals to speech-language pathologist (n=5, 71%), followed by psychologist (n=4, 57%), neurologist (n=4, 57%), neuropsychiatrist (n=3, 43%), pediatrician (n=2, 29%), psychiatrist (n=2, 29%), occupational therapist (n=2, 29%), medical doctor (n=1, 14%), early childhood professional (n=1, 14%), teacher (n=1, 14%), and 'other' not listed (n=1, 14%). Participants in Mexico that indicated other healthcare practitioners reported the following: a school that allows for inclusion and therapies where available. In the U.S. the most frequently reported healthcare practitioner professionals referred patients to after a diagnosis of ASD was also the speech-language pathologist (n=18, 62%), followed by occupational therapist (n=16, 55%), BCBA (n=15, 52%), early childhood professional (n=14, 48%), 'other' healthcare practitioner not listed (n=13, 45%), psychologist (n=11, 38%), pediatrician (n=7, 24%), psychiatrist (n=5, 17%), teacher (n=5, 17%), counselor (n=5, 17%), medical doctor (n=2, 7%), neurologist (n=2, 7%), and neuropsychiatrist (n=1, 3%). Professionals in the U.S. that indicated referral to "other" healthcare practitioners reported the following: community mental health which assesses need for BCBA, special education, admission, review, and dismissal (ARD) meeting for eligibility and placement, social work, intensive behavior therapy, and comprehensive part C teams. In addition, some participants expressed the following: any necessary referrals are based on clinical presentation, referral depends on severity of individual and their needs, doctors should be the ones to diagnose, referral is not typical, but services are provided at school, and location is very rural if diagnosis is made from team at school documents are recommended to be shared with pediatrician, if parent asks for additional recommendations help will be provided. It should be noted here that participants had the option to select more than one appropriate answer for this portion of the survey.

Table 2. Assessment and diagnostic practices in the U.S. and Mexico.

	U.S. n=29	Mexico n=7
Referral source (n, %)		
Parent	10 (34%)	6 (86%)
Pediatrician	7 (24%)	----
Teacher	5 (17%)	1 (14%)
Child psychologist	1 (3%)	----
Other	6 (21%)	----
Use of multidisciplinary team (n, %)		
Yes	24 (83%)	5 (71%)
No	4 (14%)	2 (29%)
Other	1 (3%)	----
Use of multiple settings (n, %)		
Yes	16 (55%)	2 (29%)
No	7 (24%)	3 (43%)
Sometimes	6 (21%)	2 (29%)
Assessment setting (n, %)		
Home	8 (28%)	1 (14%)
Day care	8 (28%)	1 (14%)
Medical office	3 (10%)	4 (57%)
Other	22 (76%)	1 (14%)
Professionals involved in diagnostic process (n, %)		
Medical doctor	9 (31%)	3 (43%)
Pediatrician	12 (41%)	3 (43%)
Neurologist	5 (17%)	5 (71%)
Psychologist	26 (90%)	6 (86%)
Neuropsychiatrist	3 (10%)	3 (43%)
Psychiatrist	9 (31%)	2 (29%)
Early childhood professional	11 (38%)	2 (29%)
Teacher	11 (38%)	2 (29%)
Counselor	3 (10%)	1 (14%)
Occupational therapist	10 (34%)	1 (14%)

Speech-language pathologist	18 (62%)	4 (57%)
Other	8 (28%)	
Diagnostic tool used (n, %)		
ADOS-2	22 (76%)	2 (29%)
ADI-R	14 (48%)	1 (14%)
CARS	10 (34%)	3 (43%)
DISCO	----	1 (14%)
GARS-2	8 (28%)	1 (14%)
Other	10 (34%)	2 (29%)
Diagnostic criteria used (n, %)		
ICD-10	1 (3%)	----
DSM-IV	1 (3%)	1 (14%)
DSM-IV-TR	----	4 (57%)
DSM-5	20 (69%)	6 (86%)
WHO	----	2 (29%)
MPH	----	1 (14%)
Other	7 (24%)	----
Assessment length (n, %)		
1 hour	2 (7%)	
Several hours	10 (34%)	2 (29%)
2-3 sessions	9 (31%)	4 (57%)
3+ sessions	7 (24%)	1 (14%)
Parent involvement (n, %)		
Yes	27 (93%)	7 (100%)
No	----	----
Sometimes	2 (7%)	----
Referral after diagnosis (n, %)		
Medical doctor	2 (7%)	1 (14%)
Pediatrician	7 (24%)	2 (29%)
Neurologist	2 (7%)	4 (57%)
Psychologist	11 (38%)	4 (57%)
Neuropsychiatrist	1 (3%)	3 (43%)
Psychiatrist	5 (17%)	2 (29%)
Early childhood professional	14 (48%)	1 (14%)
Teacher	5 (17%)	1 (14%)
Counselor	5 (17%)	----
Speech-language pathologist	18 (62%)	5 (71%)
Occupational therapist	16 (55%)	2 (29%)
Board certified behavior analyst	15 (52%)	----
Other	13 (45%)	1 (14%)

Note. ADOS-2=Autism Diagnostic Observation Schedule, Second Edition; ADI-R=Autism Diagnosis Interview-Revised; CARS=Childhood Autism Rating Scale; DISCO=Diagnostic Interview for Social and Communication Disorders (DISCO); GARS-2=Gilliam Autism Rating Scale-Second Edition; ICD-10=International Classification of Diseases, Tenth Revision; DSM-IV=Diagnostic and Statistical Manual of Mental Disorders, 4th Edition; DSM-IV-TR= Diagnostic and Statistical Manual of Mental Disorders, 4th Edition, Text Revision; DSM-5= Diagnostic and Statistical Manual of Mental Disorders, 5th Edition; WHO=World Health Organization Manual; MPH=Mexican Public Health Service's Clinical Guide.

Comparison of ASD Assessment and Diagnostic Practices in Mexico and the U.S.

Findings of this study identified multiple similarities when comparing the assessment and diagnosis of ASD in Mexico and the U.S. In both countries the following parallels were identified: parents were the most frequently reported referral source, most professionals reported use of multidisciplinary teams, psychologists were the most frequently reported professional involved in assessment and diagnosis of ASD, and professionals most frequently reported use of the DSM-5 for diagnostic criteria. Furthermore, the most frequently reported diagnostic tools used in both countries were the ADOS-2, CARS, and ADI-R, professionals from both countries reported involving parents in the assessment and diagnostic process more frequently than not, and in both countries the most frequently reported referral after a diagnosis of ASD was to a speech-language pathologist.

While many similarities existed amongst professionals practicing in Mexico and U.S., differences were also present. In the U.S., many professionals reported assessment of children for ASD in multiple settings whereas in Mexico, most professionals reported use of a single setting approach. In Mexico, the most frequently reported assessment and diagnostic setting for ASD was a medical office; however, in the U.S., most professionals reported use of a location other than a medical office, including the child's home and/or day care. In the U.S., the most frequently reported assessment tool was the ADOS-2 whereas in Mexico, the most frequently reported assessment tool used was the CARS. Furthermore, most professionals in the U.S. reported to assess and diagnose ASD across several hours whereas in Mexico, most professionals reported to assess and diagnose ASD across 2-3 hours.

DISCUSSION

The purpose of the current research study was to explore the assessment and diagnostic practices related to ASD in Mexico and in the U.S. This information is important because there is an extremely limited amount of information available pertaining to assessment and diagnostic practices for ASD in Mexico. Furthermore, in the U.S., the largest minority population is Hispanic and most Hispanic individuals in the U.S. identify as Mexican.[17] It is becoming increasingly more likely that professionals practicing in the U.S. will provide services to individuals that received a diagnosis of ASD in Mexico. Therefore, it is imperative that we understand the assessment and diagnostic practices being used in this country and understand how they compare to those in the U.S.

Our study found that in both Mexico and the U.S. the most frequently reported diagnostic tools were the ADOS-2, CARS, and ADI-R, and the most frequently reported diagnostic criteria was the DSM-5. These results are consistent with recommendations from the CDC and the Mexican Public Health Guide.[10,15] In addition, the results support the findings reported by Harris and Barton that professionals in Mexico used the CARS, ADOS, and ADI-R.[6] However, in both Mexico and the U.S., participants reported use of alternate diagnostic tools, criteria, and assessment tools that are not specific to ASD (i.e. the Children's Communication Checklist-2; CCC-2). Additionally, there was one participant in Mexico that reported there were no diagnostic tools available and relied on criteria from the DSM-IV as an alternate method.

For criteria used, when participants from both the U.S. and Mexico did not indicate use of the DSM-5 participants reported use of outdated versions of the DSM and alternate criteria such as the Michigan guidelines for ASD eligibility, Texas Education Agency criteria, and one participant reported not to be sure of what criteria is used. This was observed throughout professionals across different disciplines and within the same discipline. While these results should be interpreted with caution due to small sample sizes, these findings indicate a need for future studies and programs targeting knowledge of ASD. It is possible that these studies and programs could result in improved diagnostic processes resulting in more accurate and consistent diagnoses.

For use of a multidisciplinary team during the diagnostic process, many participants in Mexico and the U.S. reported to assess and/or diagnose ASD through use of a multidisciplinary team. This finding suggests that most professionals in both the U.S. and Mexico are following the current best practice recommendations.[10] It should not go without mention that some participants in both Mexico and the U.S. reported to assess and diagnose ASD individually in their current practice. This is important to note because use of a multidisciplinary team is recommended by many organizations including the CDC, NIH, the National Research Council, and use of a multidisciplinary team is indicated in the DSM-5. A multidisciplinary team diagnosis is important due to the complexity of the disorder, the variety of functioning aspects that are affected, and the need to differentiate ASD symptomology from other disorders or medical conditions.

With regards to assessing ASD in multiple settings, most participants in the U.S. reported to assess individuals in multiple settings. This is consistent with current recommendations stated by the Centers for Disease Control and Prevention.[4] However, some participants did report that assessment in multiple settings was not being practiced or only practiced sometimes. Most participants from Mexico however, reported not to assess individuals in multiple settings. Recommendations set forth by the National Research Council Committee on Educational Interventions for Children with Autism state that best practice diagnostic tools should assess social functioning in a developmental context and evaluators should take into account the variability of the individual's behavior across settings.[18,19] Assessment of participants in multiple settings is very important with respect to ASD because it helps the evaluator observe and document an individual's behavior and functional use of language across social situations. Failure to do so can result in inaccurate assessment and diagnostic results.

For referral after a diagnosis of ASD participants in Mexico and the U.S. indicated speech-language pathologists as the most frequent referral for intervention or treatment followed by occupational therapists and BCBAs in the U.S. and neurologists and psychologists in Mexico. The results obtained by participants in the U.S. are consistent with recommendations stated by the CDC.[4] According to reports by the American Academy of Pediatrics and the National Research Council, therapy approaches that focus on behavior and communication that benefit individuals with ASD include those that provide structure, direction, and organization

in addition to participation by the family.[4] These can include applied behavior analysis (ABA), occupation therapy, and speech-language therapy among others.[4]

Clinical Implications

The results of this study have clinical implications for professionals in both the U.S. and in Mexico. The findings that there were many similarities in the assessment and diagnosis of ASD between professionals practicing in Mexico and professionals practicing in the U.S. is great information. Professionals in the U.S. providing services to individuals with ASD that were diagnosed in Mexico now have some insight into the assessment and diagnostic processes and how similar (and different) they are to those in the U.S. (and vice versa). Additionally, the fact that professionals from both the U.S. and Mexico were reporting use of diagnostic tools that do not adhere to best practice guidelines, use of outdated versions of the DSM, diagnosing ASD individually, and evaluating individuals in one setting suggests areas in need of improvement. Professional improvement in these areas could lead to more accurate and timely diagnosis of ASD.

Limitations of the Present Study

A major limitation of the present study was the small sample size, especially from Mexico. A power analysis was conducted using the computer program G*power to determine the sample size necessary to detect a small effect (*f=0.25)*. Results indicated that a minimum of 210 participants would be needed.[20] A small sample size can affect generalization of results and the ability to use stronger statistical analysis. If the sample size could have been greater and more participants from different healthcare professions could have participated, the study could have had different results.

Additionally, a limited number of medical doctors participated in this study which interferes with the validity of the current findings regarding assessment and diagnostic practices related to ASD. Medical doctors are an integral part of the multidisciplinary team of professionals used to assess and diagnose ASD, their inclusion in the study could have resulted in more accurate reliable results and interpretations.

CONCLUSIONS

In conclusion, many similarities were evident when comparing ASD assessment and diagnostic practices in Mexico and the U.S. These included use of the ADOS-2, CARS, and ADI-R as diagnostic tools, criteria used for diagnosis, use of a multidisciplinary team, and referring individuals to a speech-language pathologist following a diagnosis of ASD. The main difference evident in the assessment and diagnostic practices when comparing professionals from Mexico to those from the U.S. was that in Mexico, ASD is often diagnosed in one setting, whereas in the U.S., multiple settings are utilized. Furthermore, while many healthcare professionals were found to be following current best practice guidelines, there were instances where this was not the case. For example, professionals were reporting use of diagnostic tools that did not adhere to best practice guidelines, use of outdated versions of the DSM, diagnosing ASD individually, and evaluating individuals in one setting. This finding indicates a need for continuing education which can improve the assessment and diagnostic process experienced by individuals with ASD.

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