

Article

Autism Spectrum Disorder Screening Practices in the United States and Mexico

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Abstract

Purpose: The purpose of this study was to explore screening practices for autism spectrum disorder (ASD) in Mexico and the United States (U.S.).

Methods: Data from a larger study exploring the knowledge, screening, and diagnostic practices of healthcare practitioners from Mexico and the U.S. was used for the current study. The original survey was created by experts in ASD and consisted of 63 questions: 15 demographic questions, 20 questions relating to knowledge of ASD, 11 questions relating to screening practices, and 17 questions relating to diagnostic practices. All surveys were completed by professionals engaging in the screening and diagnosis of ASD. For this study, a total of thirty-five survey responses for the screening portion of the survey (30 from the U.S. and 5 from Mexico) were explored. Qualitative data and descriptive statistics were utilized.

Results: Many of the responses relating to screening practices from professionals practicing in Mexico and the U.S. were consistent with best practice guidelines from the Centers for Disease Control and Prevention (CDC), the American Academy of Pediatrics (AAP), and the Mexican Public Health Guide. Furthermore, many similarities were found in the screening practices of professionals from both countries. Differences in screening practices reported by professionals from Mexico and the U.S. were found in the type of professional involved in the screening process and professional referrals after a failed ASD screening. Additionally, some professionals from both the U.S. and Mexico reported the use of inappropriate

screening tools, and the average age reportedly screened was much higher than the current recommendations of the American Academy of Pediatrics (Hyman et al., 2020).

Conclusion: An understanding of the screening practices currently being used in Mexico and the U.S. provides both researchers and clinicians with a better understanding of what is being implemented by different professionals. This study identified areas of strength and areas of weaknesses in the screening process for ASD in both countries. These results can now be used in future studies and programs targeting improved screening processes in Mexico in the U.S. Improved screening processes are important because of the potential to result in an earlier age of diagnosis of ASD and provision of services at a younger age. The latter of which is associated with better outcomes for children with ASD.

Keywords: autism spectrum disorder, screening, Mexico, United States.

Introduction

Autism spectrum disorder (ASD) is a neurodevelopmental disorder characterized by deficits in social interaction and communication, and restricted and/or repetitive behaviors (American Psychiatric Association [APA], 2013). In the United States (U.S.) the current prevalence rate of ASD is 1 in 44 individuals and males are more likely to receive a diagnosis of ASD than females (Centers for Disease Control and Prevention [CDC], 2021). Furthermore, fewer Hispanic children receive a diagnosis of ASD when compared to non-Hispanic black, and non-Hispanic white children and the average age of diagnosis of ASD is 4 years and 4 months (CDC, 2020).

In Mexico, the prevalence of ASD is unknown. Differences in identification procedures and limited systemic ASD tracking have been identified as possible reasons as to why the prevalence is unknown (Marquez-Caraveo & Albores-Gallo, 2011; Harris & Barton, 2017).

Researchers have attempted to estimate the prevalence rate of ASD in Mexico. These estimates have varied from 1.43 per 1,000

(Tuman et al., 2008) to 1 in 115 individuals (Fombonne et al., 2016). Most children in Mexico received a diagnosis of ASD at a later age than children in other countries (Harris & Barton, 2017). While the average age of diagnosis of ASD in Mexico is not known, children from Mexico often receive a diagnosis after 4 years of age (Harris & Barton, 2017).

Screening for ASD in the U.S.

The American Academy of Pediatrics currently recommends that all children in the U.S. be screened specifically for ASD at 18 and 24 months (Johnson & Myers, 2007; Hyman et al., 2020). Typically, screening for ASD is conducted at a pediatric office when the children and their parent(s) or caregiver are present for wellness visits. At this visit, the parent or caregiver is asked to complete a screening tool which is then scored and reviewed by the clinical staff and/or provider. The provider will discuss the results with the parent or caregiver and make subsequent referrals as necessary (CDC, N.D.).

In the U.S. some commonly used screening tools for ASD include the Modified

Checklist for Autism in Toddlers, Revised with Follow Up (M-CHAT-R/F; Robins et al., 2001; 2009) and the Screening Tool for Autism in Toddlers and Young Children (STAT; Stone & Ousley, 2008). Below is a brief description of each of these screening tools:

- M-CHAT-R/F: A valid and reliable screening tool consisting of 20 questions that are completed by the parent or caregiver. The M-CHAT is validated for children between 16 and 30 months of age.
- STAT: An empirically based, 12 item interactive screener designed to be administered by the provider. The STAT is designed for children between the ages of 26 and 36 months.

Screening for ASD in Mexico

In Mexico, screening practice recommendations are stated in the 2012 Mexican Public Health Service's Clinical Guide to Diagnosing and Managing ASD (Secretaría de Salud, 2012). This manual recommends that multiple instruments be utilized for screening individuals for ASD including the Checklist for Autism in Toddlers (CHAT), the Quantitative Checklist for Autism in Toddlers (Q-CHAT), and the M-CHAT (Secretaría de Salud, 2012). Few researchers have examined if these recommendations are being followed and what screening practices related to ASD are being used in Mexico.

While it is unclear what screening practices are being followed in Mexico, there have been investigations exploring parental concerns and reasons for seeking ASD screening and diagnosis in Mexico. A study conducted by Bravo Oro and colleagues (2014) investigated ASD in Mexico, including screening practices. This study found that in Mexico, parents are often the first individuals to express concerns about their child's development and either seek the assistance of physicians or school personnel. The most frequently reported parent concerns found in this study were that their child had

not learned to speak, their child was struggling with speaking, or their child seemed to have lost language abilities (Bravo Oro et al., 2014). Secondary concerns reported included behavioral challenges and social issues.

A study conducted by Albores-Gallo et al. (2008) found that many families in Mexico first began to suspect their child had ASD around the age of 4 years. This is interesting, considering this is the most common age for children to receive a diagnosis of ASD in the U.S. It is possible that family beliefs and perceptions toward having a child with ASD and gender roles could be influencing parents seeking screening and formal evaluations for ASD in Mexico. According to Campbell & Duarte (1993), families raising children with ASD in Mexico face multiple challenges such as potential social stigma, feelings of isolation, possible distance from family members, and depression. Additionally, in Mexico parenting is typically left to mothers and there is a prevalent notion that deficits in the child are caused by the mother (Santana & Santana, 2001). Cohen & Miguel (2018) found that social stigma, child characteristics, factors supporting development, and emotional stress were all linked to beliefs about ASD in Mexican- heritage families which directly translate to the seeking of services related to this disorder.

While studies have explored parental characteristics, concerns, and the seeking of screening and diagnosis of ASD in Mexico, it remains unclear what screening practices are being implemented. This is an area in need of much more research.

Purpose

Much is known about the screening practices for ASD in the U.S. This can be partially attributed to the Individuals with Disability Education Act (IDEA) which ensured that all children with disabilities receive free appropriate education, directly

linked to free and appropriate screening and diagnostic processes. While there is much that we know about the screening practices for ASD in the U.S., little is known about the screening practices for ASD in Mexico. Furthermore, a better understanding of adherence to best practice guidelines in both the U.S. and Mexico is necessary. This information is of great importance to ensure children with ASD are being identified and receiving the best possible care. Furthermore, a better understanding of screening practices relating to ASD in Mexico is of great importance for professionals practicing in the U.S. because the largest minority population in the U.S. is the Hispanic population (U.S. Census Bureau, 2019), and most individuals identifying as Hispanic, report origins in Mexico (U.S. Census Bureau, 2017). It is likely that professionals practicing in the U.S. will encounter individuals on their caseloads who have been screened, diagnosed, or received services related to ASD in Mexico. For professionals in the U.S. to provide the best care for individuals with ASD from Mexico, it is paramount that we understand the screening practices related to ASD in both countries. The focus of this paper will be on the screening practices related to ASD in Mexico and in the U.S. More specifically, the aim of this study is to determine current screening practices for ASD in Mexico and the U.S. and compare and contrast the screening practices for ASD in Mexico and the U.S.

Methods

The data used for the current study was obtained from a larger study conducted by the authors of this paper. Approval from the University of Texas Rio Grande Valley (UTRGV) Institutional Review Board (IRB) was obtained.

Procedure

Data for the current study was obtained from a larger study exploring ASD related knowledge, screening, and diagnostic practices in Mexico and the U.S. Participants for this study included healthcare professionals from the following fields: Medical Doctors, Pediatricians, Neurologists, Psychiatrists, Neuropsychologist, Psychologists, Early Childhood Professionals, Teachers, Counselors, Speech and Language Pathologists, Occupational Therapists, and Behavior Analysts. The decision was made to include these specific professionals in this study because these professionals are frequently involved in the screening and diagnosis of ASD and are recommended to be part of a multidisciplinary team for the diagnosis of ASD (CDC, 2018).

Participants were recruited via e-mail in both English and Spanish. The recruitment e-mail contained a detailed description of the research study and healthcare professionals interested in participating were directed to select a link to the survey in English or Spanish depending on preference. Participation in the survey was completely voluntary and there was no incentive for participation.

The original survey consisted of a total of 63 questions designed by experts in ASD: 15 demographic questions, 20 questions addressing knowledge of ASD, 11 questions addressing screening of ASD, and 17 questions addressing diagnosis of ASD. For this study, only data related to screening practices was utilized. This section of the survey included a total of 11 multiple choice and fill in the blank questions. The first question asked the participant if he/she was currently involved in the screening process for ASD. If the participant selected 'Yes', then his/her responses were included in this analysis. If the participant selected 'No', their responses were not included in this analysis. The remaining ten questions

addressed the following: screening tools used by participants, validation of the screening tool for English and/or Spanish speakers, involvement in the screening process, referral process after screening, parent involvement, primary concerns, routine screening of children, and age range of most frequent population screened. See Appendix A for the screening portion of the survey.

Participants

For the screening portion of the survey, 30 professionals from the U.S. indicated that they currently participated in screening practices associated with ASD: 18 speech-language pathologists, 7 psychologists, 2 early childhood professionals, 1 teacher, 1 psychiatrist, and 1 Board Certified Behavior Analyst (BCBA). Five professionals from Mexico indicated that they currently participated in screening practices associated with ASD: 1 speech-language pathologist, 2 pediatricians, 1 neuropsychologist, and 1 psychologist. Therefore, the sample for the current study included 35 professionals currently engaged in screening of ASD, 30 from the U.S. and 5 from Mexico. See Table 1.

Below are the inclusion criteria for participation in the study:

1. Licensed health care professional in one of the following medical fields: general medicine, neuropsychology, pediatrics, neurology, psychiatry, speech and language pathology, psychology, early childhood, education, counseling, occupational therapy, and behavior analysis.
2. Current practice in Mexico or the U.S.
3. Encounter individuals diagnosed with ASD in their practice and/or screen and/or diagnose ASD.

Results

Screening Instruments Used

For the survey question addressing which screening instrument(s) was being used, participants had the option to select more than one appropriate answer as a variety of screening instruments are often used dependent multiple factors. In Mexico, the most frequently reported screening tool used was M-CHAT ($n=5$, 100%), followed by the Childhood Autism Rating Scale (CHAT; $n=3$, 60%), and the Quantitative Checklist for Autism in Toddlers (Q-CHAT; $n=1$, 20%). One participant indicated use 'other screening instruments not listed' ($n=1$, 20%) which were the Autism Diagnostic Observation Schedule (ADOS) and the Toddler Autism Symptom Interview (TASI).

In the U.S. the most frequently reported screening tool used was also the M-CHAT ($n=18$, 60%), followed by the Ages and Stages Questionnaire (ASQ; $n=6$, 20%), the Communication and Symbolic Behavior scale (CSBS; $n=3$, 10%), CHAT ($n=3$, 10%), STAT ($n=2$, 6%), Q-Chat ($n=2$, 6%), and the Parents Evaluation of Developmental Status (PEDS; $n=1$, 3%). A total of 16 participants designated use of 'other screening instruments' and when asked to describe 'other' the following were indicated: the Battelle screener, the Comprehensive Assessment of Spoken Language (CASL)-Pragmatics Subtest, ADOS, Social Communication Questionnaire (SCQ), informal screenings with guidelines learned from ADOS, Children's Communication Checklist-2 (CCC-2), the Developmental Indicators for Assessment of Learning (DIAL), Developmental History Questionnaire (a measure based off ADOS questions which is clinic specific), the Gilliam Autism Rating Scale, third edition (GARS-3), M-CHAT R/F, the Childhood Autism Rating Scale (CARS), social and emotional learning competencies, student interview, and teacher input, and pragmatic

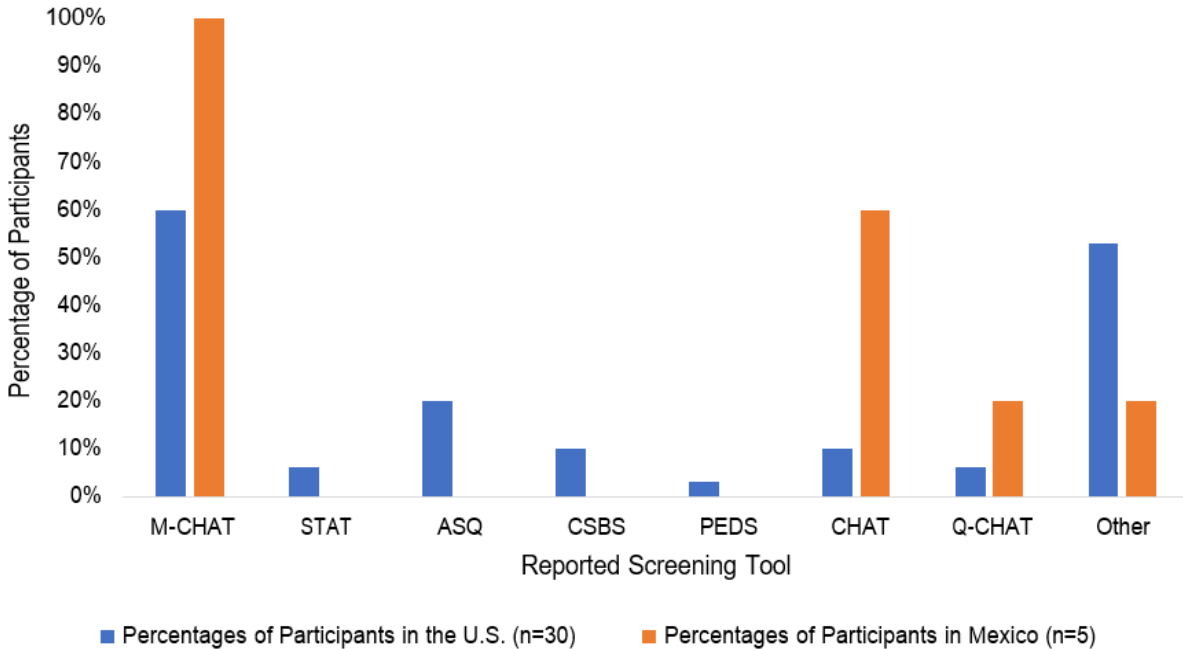
Table 1*Demographic Information for Participants in the U.S. and Mexico*

	U.S. <i>n</i> =30	Mexico <i>n</i> =5
Gender		
Female	28	4
Male	2	1
Age		
18-25	2	1
26-30	3	2
31-35	5	1
36-40	4	0
41-45	6	1
46-50	3	0
50+	7	0
Education		
Bachelor's degree	1	0
Master's degree	16	0
Ph.D.	8	0
M.D.	1	2
Psy.D.	4	2
Other	0	1
Years of Experience		
0-5 years	4	2
5-10 years	4	1
10-15 years	8	2
15-20 years	8	0
>20 years	6	0
Profession		
SLP	18	1
Psychologist/neuropsychologist	7	2
Early childhood professional	2	0
Teacher	1	0
Psychiatrist	1	0
BCBA	1	0
Pediatrician	0	2

Note. Participants were able to select more than one answer for the question regarding setting. SLP=speech-language pathologist; BCBA=board certified behavior analyst.

Figure 1

Percentage of Participants Using Various Screening Instruments



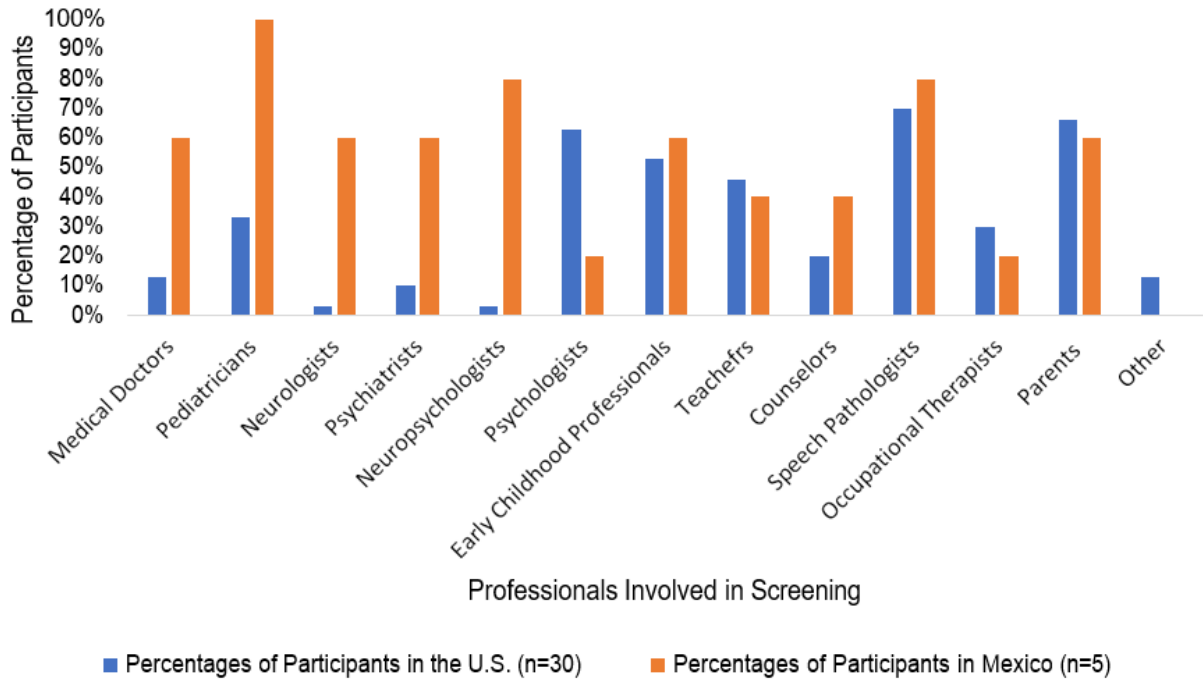
informal assessment, informal and formal observations, teacher interview, parents interview and language/pragmatic questionnaires and checklists. See figure 1 above.

Professionals Involved in Screening Process

When asked what professionals were involved in the screening process participants had the option to select more than one appropriate answer as a variety of healthcare practitioners are often involved in screening for ASD. In Mexico, the most frequently reported professional involved were pediatricians ($n=5$, 100%), followed by neuropsychologists ($n=4$, 80%), speech-language pathologists ($n=4$, 80%), medical doctors ($n=3$, 60%), neurologists ($n=3$, 60%), psychiatrists ($n=3$, 60%), early childhood professionals, ($n=3$, 60%), parents ($n=3$, 60%), teachers ($n=2$, 40%), counselors ($n=2$, 40%), psychologists ($n=1$, 20%), and

occupational therapists ($n=1$, 20%). Participants did not indicate the participation of other healthcare practitioners.

In the U.S. the most frequently reported professional involved was a speech-language pathologist ($n=21$, 70%), followed by parents ($n=20$, 66%), psychologists ($n=19$, 63%), early childhood professionals ($n=16$, 53%), teachers ($n=14$, 46%), pediatricians ($n=10$, 33%), occupational therapists ($n=9$, 30%), counselors ($n=6$, 20%), medical doctors ($n=4$, 13%), other healthcare practitioners not listed ($n=4$, 13%), psychiatrists ($n=3$, 10%), neurologists ($n=1$, 3%), and neuropsychologists ($n=1$, 3%). Participants also indicated the participation of the following healthcare practitioners not listed: diagnostician, school psychologist, and other trained/qualified study personnel. See figure 2.

Figure 2*Professionals Involved in Screening***Referral Process**

When professionals were asked which professional(s) they refer to after a failed ASD screening, professionals were allowed to select more than one answer as a variety of referrals are often made. In Mexico, the most frequently reported professionals individuals were referred to for a diagnostic evaluation were neurologists ($n=3$, 60%) and speech-language pathologists ($n=3$, 60%), followed by the participant themselves (self-referral) ($n=2$, 40%) and psychologists ($n=2$, 40%). Only one participant reported referral to psychiatrists ($n=1$, 20%), occupational therapists ($n=1$, 20%), and other healthcare practitioners not listed ($n=1$, 20%). Participants from Mexico indicated the following as other professionals that individuals failing ASD screenings are referred to for a diagnostic evaluation: pedopsychiatrist/child psychiatrist. In the U.S. the most frequently reported professional an individual was reported to be

referred to for a diagnostic evaluation was psychologists ($n=19$, 63%), followed by the participant themselves (self-referral) ($n=10$, 33%), medical doctors ($n=8$, 26%), pediatricians ($n=8$, 26%), other healthcare practitioners not listed ($n=8$, 26%), neurologists ($n=7$, 23%), speech-language pathologists ($n=6$, 20%), psychiatrists ($n=5$, 16%), neuropsychologist ($n=4$, 13%), early childhood professionals ($n=4$, 13%), and occupational therapists ($n=3$, 10%).

Participants indicated the following as other professionals that individuals failing ASD screenings can be referred to for a diagnostic evaluation: community mental health, special education, Licensed Specialist in School Psychology (LSSP), and developmental pediatrician. The U.S. participants also expressed that “it depends on the context/situation, as well as the resources available and the complexity of the case.” See figure 3.

Figure 3

Professional Referral After Failed ASD Screening

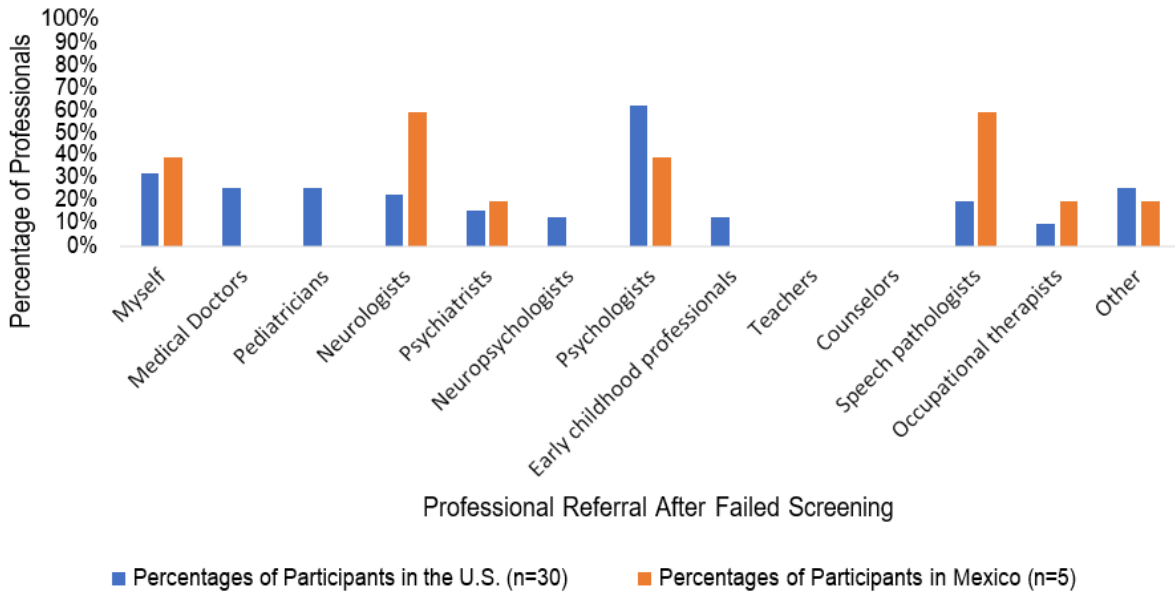
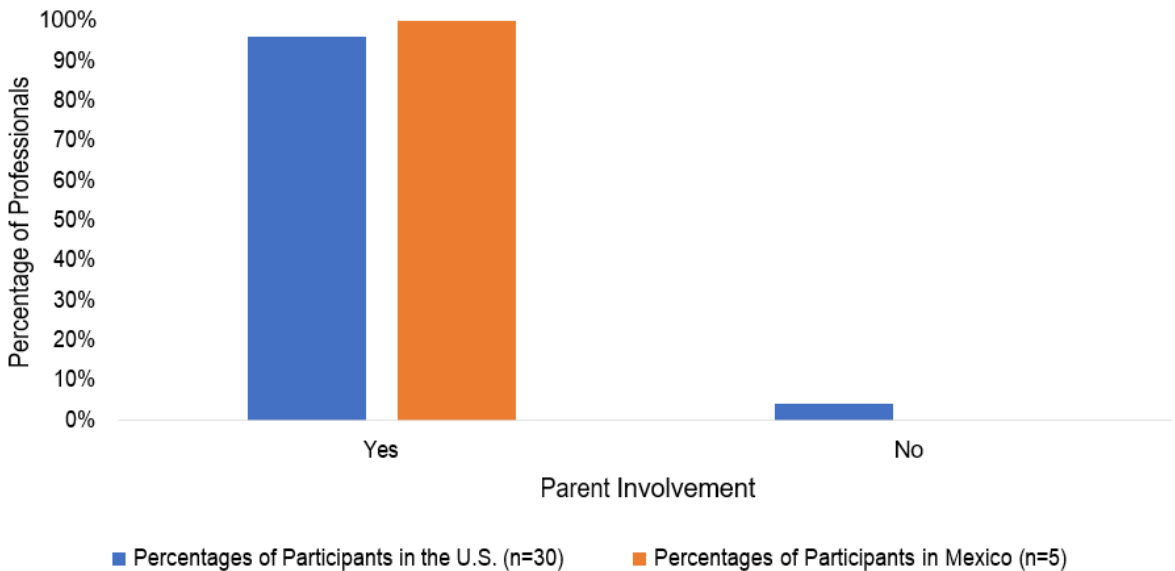


Figure 4

Reported Percentages of Parent Involvement in Screening Process



Parent Involvement

In Mexico, parent involvement was reported by 100% (n=5) of healthcare

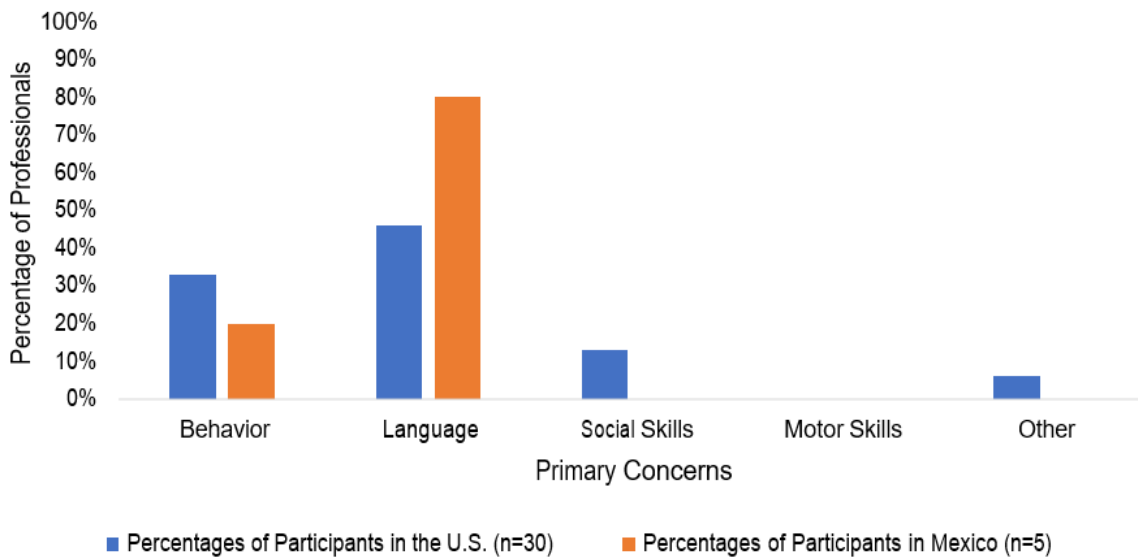
professionals. In the U.S. participants reported 96% (n=29) parent involvement and only 3% (n=1) reported no parent involvement. See figure 4 above.

Primary Concern(s)

When asked about the individual's or family's primary concern at the time of ASD screening, participants in Mexico reported language as the primary concern ($n=4$, 80%), followed by behavior ($n=1$, 20%). Participants in the U.S. also reported language as the primary concern ($n=14$, 46%), followed by behavior ($n=10$, 33%), social skills ($n=4$, 13%), and other concerns not listed ($n=2$, 6%). Participants in the U.S. indicated speech as other primary concerns reported. In addition, participants expressed "it's different for every family, but most are worried about their child's future and what kind of life they will have." See figure 5.

Figure 5

Reported Percentages of Primary Concern



($n=10$) and 66% reported not to ($n=20$). See figure 6.

Age Range Most Frequently Screened

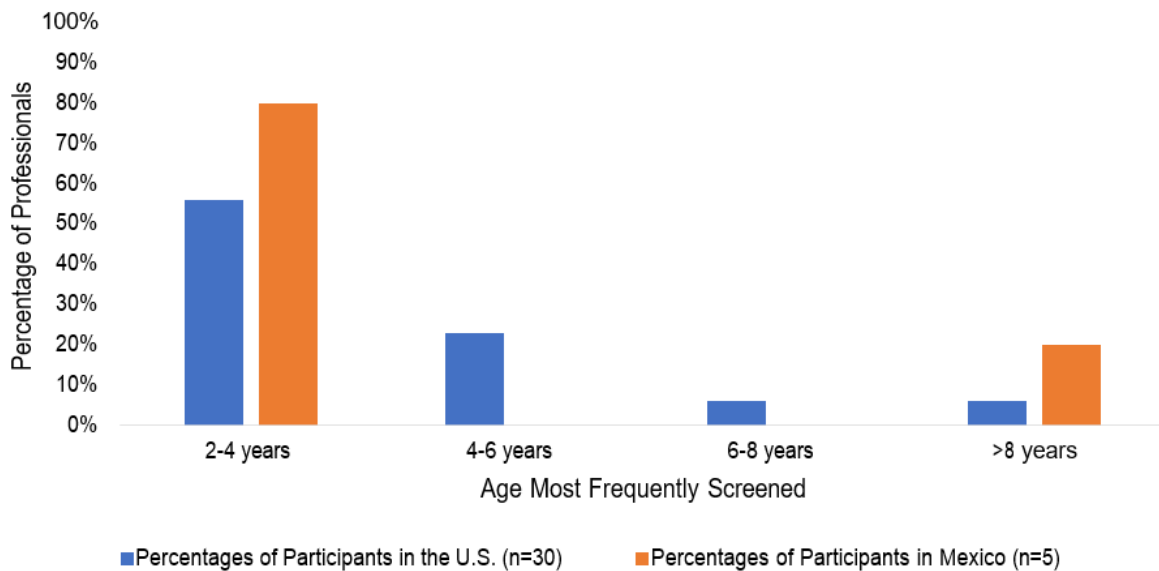
Regarding the age range most frequently screened, participants in Mexico reported the age range of 2-4 years ($n=4$, 80%), followed by >8 years ($n=1$, 20%) as the most frequently screened. In the U.S., participants reported the most frequent age range screened, ($n=17$, 56%), followed by 4-6 years ($n=7$, 23%), 6-8 years ($n=2$, 6%), and >8 years ($n=2$, 6%). See figure 7.

Routine Screening for ASD

When professionals were asked if they completed routine ASD screenings for children, 20% of participants in Mexico reported 'yes' ($n=1$), and 80% reported not routinely screening children for ASD ($n=4$). In the U.S. 33% of participants reported 'yes' to routinely screening children for ASD

Figure 7

Reported Percentages of the Age Range Most Frequently Screened



Discussion

At the outset, the authors would like to acknowledge that the sample sizes in this study were unbalanced and small. All conclusions should be interpreted within this context and there is a great need for future studies before these findings should be translated into clinical practice. Having said that, this is one of the first studies exploring screening practices related to ASD in Mexico. Additionally, this study provided descriptive information pertaining to screening practices being implemented across disciplines in both Mexico and the U.S. which is of great importance because the current average age of diagnosis of ASD in the U.S. is four years and four months (CDC, 2020) and the current average age of diagnosis of ASD in Mexico continues to be unknown but is suspected to be higher than the age of 4 years. If screening practices are explored and improved, we can potentially lower the average age of diagnosis of ASD and begin providing children with ASD

appropriate interventions at much younger ages which is known to be associated with better outcomes (Estes et al., 2015; Sullivan et al., 2014). Furthermore, the largest minority population in the U.S. is the Hispanic population (U.S. Census Bureau, 2019), and most individuals identifying as Hispanic, report origins in Mexico (U.S. Census Bureau, 2017). Professionals practicing in the U.S. likely will encounter individuals on their caseloads that have been screened, diagnosed, or received services related to ASD in Mexico. For professionals in the U.S. to provide the best care for individuals with ASD from Mexico, it is paramount that we understand the practices related to ASD in both countries.

This study found that in both Mexico and the U.S. the most frequently reported screening tool was the M-CHAT which is consistent with recommendations from both the Mexican Public Health Guide (2012), the American Academy of Pediatrics (Johnson & Myers, 2007; Hyman et al., 2020), and the Centers for Disease Control and Prevention (CDC, 2018). However, in both Mexico and

the U.S., participants reported use of standardized assessment tools as screeners. (e.g. the ADOS and the GARS-3). Standardized assessments are intended to be used during a diagnostic process and not for screening purposes. In addition, participants in the U.S. indicated the use of informal observations, pragmatic checklists, and parent/teacher interviews. The results demonstrate consistent screening practices in Mexico and in the U.S. (e.g. use of the M-CHAT); however, differences are also present and, in both countries, inappropriate screening tools were reported to be used. While more research is needed to confirm these findings, it is possible that education about appropriate screening tools for ASD could result in earlier and more appropriate identification.

In Mexico the most frequently reported professionals involved in the screening process were pediatricians followed by neuropsychologists and speech-language pathologists. This finding was consistent with recommendations stated in the Mexican Public Health Guide that ASD be screened and diagnosed by a family doctor, a medical psychiatrist, or a developmental psychiatrist with a primary focus on infants and adolescents (Secretaría de Salud, 2012). These findings also support the results obtained from a study conducted by Harris and Barton (2017) which found that psychologists followed by medical doctors and neuropsychologists most commonly were involved in screening and diagnostic assessments (Harris & Barton, 2017). The findings of the current study and those of Harris and Barton (2017) support that in Mexico medical doctors (including pediatricians) and neuropsychologists are most likely to be involved in the screening. This is consistent with pediatricians frequently screening ASD in the U.S. It appears that similarities do exist in the screening practices for ASD in both Mexico

and the U.S. More research is needed to investigate this topic.

In the U.S., the most frequently reported individuals involved in the screening process were speech-language pathologists, followed by parents, and psychologists. This finding was interesting as the American Academy of Pediatrics (Hyman et al, 2020) currently recommends that all children be screened for ASD at their 18- and 24 -month well visits. Primary healthcare providers, such as pediatricians, are currently the ones in the position to screen children at an early age for developmental delays and disabilities during regular well-child doctor visits (CDC, 2018). Parents and/or caregivers are more likely to contact primary health providers than speech-language pathologists or psychologists at young ages. If primary health providers are not screening for ASD and children are being screened by speech-language pathologists and Psychologists, this could ultimately be impacting the age of identification of ASD. However, it should be noted here that most participants from the U.S. were in fact speech-language pathologists, so this may have skewed the results.

In both Mexico and the U.S. over 90% of the participants indicated that parents were involved in the screening process. These results are consistent with recommendations stated by the CDC (2018) as parent information is critical to the screening process. Additionally, in both Mexico and the U.S. professionals indicated that the primary concern reported by parents was language followed by behavior. These results are consistent with the results obtained from Bravo Oro et al. (2014) study in which language and then behavior challenges were the primary concerns reported in Mexico.

Results obtained regarding routine screening showed that in both Mexico and U.S., more than 60% of the participants reported not routinely screening individuals for ASD. This finding could reflect the sample in this study. Medical doctors, the

primary profession to routinely screen for ASD, were poorly represented in the sample. The participants that did indicate routinely screening for ASD were speech-language pathologists, psychologists, behavior analysis, teachers, and early intervention specialists. It was interesting to observe that participants in the medical field that are recommended to screen for ASD did not indicate doing so. The fact that only 60% of the sample in this study reported routinely screening for ASD demonstrates that there is room for improvement. If professionals other than medical doctors begin to routinely screen for ASD in the U.S. and in Mexico, it is possible that we can identify more children with ASD at younger ages and provide these individuals with services at much younger ages, resulting in better outcomes.

Professionals from both Mexico and the U.S. most frequently reported screening between the ages of 2 and 4 years. These results are inconsistent with recommendations stated by the American Academy of Pediatrics which indicate that all children be screened for ASD at their 18- and 24-month well-child visits (Hyman et al., 2020). Regarding Mexico, these results are consistent with results obtained from the Harris and Barton study (2017) which state that as of 2014, it was found that families in Mexico first began to suspect ASD around the age of 4 (Albores-Gallo, et al., 2008). This information is of great concern because the earlier a child can be screened and diagnosed the earlier they can begin to receive services for ASD which is crucial for their development.

In Mexico, when individuals failed their screenings for ASD, the most frequently reported healthcare practitioners an individual was referred to for a diagnostic evaluation was a neurologist, followed by speech-language pathologists, and psychologists. These results are consistent with results obtained by the study conducted by Harris and Barton (2017) which indicated

that the healthcare provider that most commonly diagnoses ASD in Mexico is the psychologist, followed by medical doctors. In the U.S. when individuals failed their screening for ASD, the most frequently reported healthcare practitioners an individual was referred to for a diagnostic evaluation was a psychologist, followed by medical doctors, and pediatricians. These results are somewhat consistent with recommendations from the CDC (2018), which state that if screening instruments indicate the possibility of ASD, a more comprehensive evaluation by a multidisciplinary team including a psychologist, neurologist, psychiatrist, speech therapist, and other professionals is recommended.

In conclusion, many similarities in screening practices were evident in Mexico and the U.S. These included use of the M-CHAT, parent involvement, language being reported as the primary concern, lack of routine screening for ASD, and screening individuals between the ages of 2 and 4 years. Differences were also evident in the responses of professionals from the U.S. and Mexico. Differences included the professionals involved in the screening process and professional referrals after a failed ASD screening. Results of this can be used to guide future studies and projects targeting improved ASD screening processes in both the U.S. and Mexico which can ultimately impact the age of diagnosis of ASD, resulting in better outcomes for individuals diagnosed with this disorder.

Clinical Implications

The results of this study have clinical implications for practitioners in both the U.S. and in Mexico. While many of the professionals from Mexico and the U.S. provided responses that were consistent with current recommendations, professionals also provided responses that were not consistent with current recommendations (e.g., use of inappropriate screening tools). This directly

impacts the accuracy of screening and can delay appropriate diagnosis for a child with ASD. Additionally, differences were found in screening practices conducted in the U.S. and in Mexico. Professionals in the U.S. need to be aware of these differences when encountering patients that were screened for ASD in Mexico (and vice versa) to provide the best possible care. This is of particular importance when considering that the largest minority population in the U.S. is the Hispanic population (U.S. Census Bureau, 2019), and most individuals identifying as Hispanic, report origins in Mexico (U.S. Census Bureau, 2017). It is likely professionals providing services to individuals diagnosed with ASD in the U.S. will have children from Mexico on their caseloads.

Limitations of the Present Study

The sample of this study was the largest limitation. Our sample was relatively small, especially the sample from Mexico, and there was an underrepresentation of medical doctors. A small sample size affects the ability to use stronger statistical analysis and affects generalization of the results. A larger and more diverse sample could have created different results.

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Appendix A

Survey questions relating to Screening practices

1. Are you involved in the screening process for ASD?
 - Yes
 - No
 - Other

2. What screening instruments/tools do you currently use? Select all that apply.
 - Modified Checklist for Autism in Toddlers (M-CHAT)
 - Screening Tool for Autism in Toddlers and Young Children (STAT)
 - Ages and Stages Questionnaires (ASQ)
 - Communication and Symbolic Behavior Scales (CSBS)
 - Parents' Evaluation of Developmental Status (PEDS)
 - Checklist for Autism in Toddlers (CHAT)
 - Quantitative Checklist for Autism in Toddlers (Q-CHAT)
 - Other (If other specify)

3. Is the screener that you currently use validated or standardized for English speaking individuals?
 - Yes
 - No
 - I don't know

4. Is the screener that you currently use validated or standardized for Spanish speaking individuals?
 - Yes
 - No
 - I don't know

5. Who is typically involved in your screening process? (Select all that apply)
 - Medical Doctors
 - Pediatricians
 - Neurologists
 - Psychiatrists
 - Neuropsychologists
 - Psychologists
 - Early childhood professionals
 - Teachers
 - Counselors
 - Speech and Language Pathologists
 - Occupational Therapists
 - Parents
 - Other (If other please indicate)

6. When an individual does not pass his/her ASD screening, which healthcare professional(s) do you refer them to? Select all that apply

- Myself
- Medical Doctors
- Pediatricians
- Neurologists
- Psychiatrists
- Neuropsychologists
- Psychologists
- Early childhood professionals
- Teachers
- Counselors
- Speech and Language Pathologists
- Occupational Therapists
- Other (If other please indicate)

7. Are parents involved in the screening process?

- Yes
- No

8. In your opinion, when an individual is suspected of having ASD, what are the majority of the families' or individuals' primary concerns?

- Behavior
- Language
- Social
- Motor skills
- Other (If other specify)

9. Are you required to routinely screen children for ASD in your practice?

- a. Yes
- b. No

10. At what age(s) are you required to screen children for ASD?

- a. Fill in the blank

11. What age range represents the most frequent population that you screen?

- 2-4 years
- 4-6 years
- 6-8 years
- >8 years old