

A Review of EI/ECSE Systems Across Four Settings: Procedures and Lessons Learned

Serra Acar¹⁾

University of
Massachusetts Boston

Songtian Zeng

Ching-I Chen

Kent State
University

Huichao Xie

Nanyang Technological
University

Abstract

There is currently no reliable information on the number of children with disabilities across the globe due to differences in terminology, child find systems, and available of psychometrically sound assessment tools to identify children timely. This literature review examines the extant literature related to assessment methods used for identification of children for early intervention/early childhood special education (EI/ECSE) services in four settings: China, Singapore, Taiwan, and Turkey. Search criteria for the study started with peer-reviewed articles, published in English between 2008 and 2019. In addition to the peer-reviewed article search, government reports and technical evaluation papers in each setting's native language are included. Findings are summarized in the following areas: 1) legal foundations; 2) assessment procedures on identification of young children with disabilities, and 3) education services for children with disabilities and their families. Similarities and differences across four settings regarding the EI/ECSE systems and initiatives are examined. Implications for research and practice are discussed.

Key words : early intervention, disabilities, screening, assessment

Corresponding author, ¹⁾ serra.acar@umb.edu

Introduction

There are about a billion people living with disabilities, which equates to approximately 15% of the world's population (United Nations International Children's Emergency Fund [UNICEF], 2017a; World Health Organization [WHO], 2018). However, there is currently no reliable information on the number of children with disabilities across the globe (WHO, 2018). Existing preliminary estimates of disabilities vary considerably, due to differences in definitions and terminology, child find systems, available resources, and the use of psychometrically sound assessment tools to identify children with disabilities (UNICEF, 2017a). As a result, the majority of children with disabilities may neither be timely identified nor receive early intervention/early childhood special education (EI/ECSE) services. Further research is needed on the complexities of EI/ECSE systems to support child and family outcomes in different settings with their unique cultural, sociopolitical, and economic conditions. A multidimensional review could explore the intersection between EI/ECSE systems and create sustainable solutions for future research and practice.

For this study, EI/ECSE is defined as a system of services that supports children (birth to six) with diagnosed disabilities through the provision of services that assist them in maximizing their development through a family-centered approach. The purpose of this study is to present a systematic review of the existing literature on the assessment methods in EI/ECSE services in four settings: China, Singapore, Taiwan, and Turkey. We aim to bring differences and similarities into the surface in order to better understand the EI/ECSE services in each setting. The primary aims of this systematic review are to summarize and evaluate the evidence on legal foundations of the EI/ECSE services for children with disabilities. The secondary aims of this systematic review are to identify the gaps in the EI/ECSE field and to suggest future research directions in four settings.

Methods

We developed formal inclusion criteria to define the parameters for the research to be included within the scope of this study. In this review, the term "disability" is used to refer

to a range of difficulties experienced by children (birth to six years), including developmental delay in the areas of cognitive, language, social-emotional, behavioral, and neuromotor development. Search criteria for the study started with peer-reviewed articles, published in English between 2008 and 2019. Four electronic databases were searched (Academic Search Complete, Education Research Complete, ERIC, and PsycInfo) using the following keywords: “at-risk,” “special needs,” “disability,” “assessment,” “eligibility,” “policy/law,” “early intervention,” “early childhood special education,” “child,” “screening,” and “evaluation” independently for each setting. This initial screening search returned more than 200 peer-reviewed articles. Results were narrowed by reading titles that appeared to meet the purpose of this study, and further narrowed by reading the abstracts or full texts. In order to establish validity and reliability of the research findings, we developed a coding sheet and instructions that operationally defined each construct measured and provided related examples. The first author provided an example of a coded study and discussed the procedures with the other authors while going through the article and coding sheet. Then, each author coded studies that she collected from each setting. Minor disagreements were resolved by consensus after comparing evidence.

Furthermore, similar procedures were followed for hand searches of government reports and technical evaluation papers in each setting’s native language. Each author, who is a native speaker for the setting’s dominant language, included studies that she collected. This was a necessary step to broaden our understanding of the assessment methods used for identification of children for EI/ECSE services in four settings. A final search was conducted in international organizations’ databases to obtain the most accurate information on each setting. Studies were included if they met the following criteria: (a) publicly accessible in English or electronically available in native language; and (b) provided information on EI/ECSE policy, assessment, and services for children with disabilities and their families.

Literature Across Four Settings

Results from the study are organized into three interrelated aspects of EI/ECSE systems:

legal foundations, assessment practices and procedures, and education services for children with disabilities and their families. This review is not meant to be comprehensive, but merely to provide a meaningful snapshot of the findings on EI/ECSE systems across four settings. Table 1 provides a summary of the EI/ECSE profile in four settings.

Table 1. *A Summary EI/ECSE Profile in Four Settings*

Setting	Number of children with disabilities	Definition of disability	EI/ECSE legislation
Mainland China*	Over 1.4 million	“One who suffers from abnormalities or loss of a certain organ or function, psychologically or physiologically, or in anatomical structures, and who has lost wholly or in part the ability to perform an activity in the way considered normal” (China Disabled Persons’ Federation; CDPF, 2011)	The Law of the People’s Republic of China on Protection of Persons with Disabilities
Singapore	~ 7,000	“Those whose prospects of securing, retaining places and advancing in education and training institutions, employment and recreation as equal members of the community are substantially reduced as a result of physical, sensory, intellectual and developmental impairments” (Steering Committee on the Enabling Masterplan, 2011, p. 1-1)	There is no existing legislation specifically related to special education or early identification, a series of Enabling Masterplans (EMs) have been published
Taiwan	~ 26,000	“Children under six years old who have received a diagnosis given by government certified child developmental clinic indicating delays in cognitive, communication, motor, social-emotional, and adaptive domains” (Ministry of Health and Welfare of Taiwan, 2015)	The Protection of Children and Youths Welfare and Rights Act and its Bylaws, the Special Education Act and its Bylaws, the People with Disabilities Rights Protection Act and its Bylaws
Turkey*	~ 690,000	a person with a disability is defined as a person with significant difference from the levels expected compared to their peers in terms of personal characteristics and educational proficiency due to a variety of reasons (Special Education Law 573)	Special Education Law 573

Mainland China

It is estimated that there are over 1.4 million children with disabilities under six years old in mainland China (Xie et al., 2008). The prevalence, however, is unclear as no official statistic is available regarding the total population and percentage of children with disabilities. Also, the identification and terminology used for disabilities between China and Western countries, such as the United States, differ considerably (Ellsworth & Zhang, 2007). For example, the estimated prevalence of Autism Spectrum Disorder (ASD) in China has been consistently reported to be lower than most of the studies in the West due to inconsistent diagnostic procedures and discrepancies in diagnostic criteria (Pang et al., 2018). Literature (e.g., Zhou & Xu, 2019) related to early diagnosis and EI/ECSE services for children with ASD is gaining popularity due to the rising prevalence estimate (ranging from 0.6%-1% based on expert consensus).

Legal foundations

The Law of the People's Republic of China on Protection of Persons with Disabilities is the first legislation to call for ECSE services (National People's Congress, 1990). According to the law, a person with a disability is defined as "one who suffers from abnormalities or loss of a certain organ or function, psychologically or physiologically, or in anatomical structures, and who has lost wholly or in part the ability to perform an activity in the way considered normal" (China Disabled Persons' Federation [CDPF], 2011). Recently, the government is attempting to establish a system to support children through early identification, screening, reporting, rehabilitation, and education (CDPF, 2011). Since then, several national policies are released to encourage efforts to provide EI, including private education agencies and non-governmental organizations (Hu & Yang, 2013). For example, high quality private EI agencies are acknowledged and supported by the government through tax exempt and service purchase agreement. Nonetheless, the law and policies only provide some general guidelines and the EI services are not mandated (Hu & Yang, 2013). It is often up to the parents to request developmental screening for their children and be the primary source for the bills (Eichner, Groark, & Palmov, 2011; Hu, 2010).

Procedures and practices

Little literature devoted to identifying ways to develop and implement evidence-based assessment and EI practices with cultural consideration (Zhang & Yang, 2011). Healthcare specialists have made considerable efforts to promote parents' awareness about early identification and EI services. However, a more robust EI system must be established in the next few decades. Yet due to uneven population increase, the screening and referral practices are a mix of parental initiation and local mandate. Specifically, some disabilities, such as Down syndrome, can be identified during pregnancy or the first few months of life through regular medical check-ups. Meanwhile, other disabilities, such as ASD, may rely on the parents' initiation or preschool teachers' suggestions (Zhang & Yang, 2011). Moreover, newborn baby hearing screening is established to identify and prevent hearing loss (CDPF, 2006). To make sure children are diagnosed systematically and receive EI services, some local states and hospitals have carried out universal developmental screening for ASD and other developmental delays for children up to five years of age (CDPF, 2011).

There is a lack of high-quality screening and diagnostic assessment tools to support the screening and diagnostic procedures (Deng, Poon-McBrayer, & Farnsworth, 2001). Only a few screening (e.g., the Modified Checklist for Autism Toddlers [M-CHAT]) and diagnostic instruments (e.g., Autism Diagnostic Interview – Revised [ADI-R]) are translated from the Western studies and have been applied with considerations of cultural adaptation. Meanwhile, some additional developmental assessment tools are be utilized. For example, the Ages & Stages Questionnaires: Social-Emotional (ASQ: SE) is adapted and utilized in China (Bian, Xie, Squires, & Chen, 2017).

The diagnostic process provides a psychological profile of a child's health and development. In terms of the diagnosis process, many medical professionals rely on clinical judgement, in addition to testing and observation to conduct the diagnosis. Still, few interdisciplinary assessments are carried out by medical professionals. In some cities with high urban populations (e.g., Beijing and Shanghai), specialized interdisciplinary teams focusing on ASD diagnosis have been established (Zhang, Chen, Wang, & Li, 2009). However, families usually receive assessment results from medical professionals on diagnosis and treatment for their children. Collaboration between physicians, EI professionals, and related service providers appears to be limited. In rural areas, few

assessment specialists exist for ASD diagnosis and they refer parents to healthcare centers in urban areas for further diagnosis.

After confirming the child's diagnosis, parents have the right to apply for a disability identification card for their children, a legal document authorized by the CDPF to provide them with EI resources and financial support. EI programs in China are provided by both public and private organizations. The public organizations are mainly special schools, rehabilitation centers, childcare centers or kindergartens. As local government bodies, Local Associations of Persons with Disabilities (LAPDs) in some rural areas provide EI services, because the local education sectors are unable to provide intervention to the large numbers of children. Private services are also available, and they are usually intensive, comprehensive, and provide one-to-one training. Therefore, the service fee is much higher than for public programs (Zhang et al., 2009). The parents have to bear most of the expense if they choose to obtain private agency services.

Singapore

Singapore is located in Southeast Asia with a population of 5.6 million, of which about 75% identified as Chinese ethnic, 14% as Malay, 9% as Indian, and 3% as "other ethnic groups" (Department of Statistics Singapore, 2018). The four official languages include English, Mandarin, Malay, and Tamil. According to the most recent official report, there are about 7,000 (or 3.2% of) children (birth to seven years) identified with some kind of disability (Enabling Masterplan Steering Committee, 2011). This is an underestimation of the general population given the low follow-through rate of the developmental screening procedure (Koh et al., 2016). The definition of disability is inferred in the definition of people with disabilities as "those whose prospects of securing, retaining places and advancing in education and training institutions, employment and recreation as equal members of the community are substantially reduced as a result of physical, sensory, intellectual and developmental impairments" (Enabling Masterplan Steering Committee, 2011). In Singapore, children receive early childhood education from birth to six years old and enter primary education at the age of seven (Early Childhood Development Agency of Singapore, 2017).

Legal foundations

There is no existing legislation specifically related to special education or early identification. A series of Enabling Masterplans (EMs) have been published by the government as guidance for disability service delivery, following a “many helping hands” approach that emphasizes the collaboration of public agencies, private organizations, and individuals. EI programs have been developed to meet the needs of children with disabilities and their families. As the official guideline, the EM (Enabling Masterplan Steering Committee, 2016) describes a developmental screening network consisting of efforts from primary care agencies (e.g., hospitals), families and caregivers, and other community partners (e.g., preschools). This description of the developmental screening network seems to be consistent with the international literature that finds that effective early identification requires coordination across disciplines (Bricker, Macy, Squires, & Marks, 2013).

Procedures and practices

According to the EM (Enabling Masterplan Steering Committee, 2016), once a child is identified with disabilities, they should be referred to EI services. From 2010 to 2015, the number of newly diagnosed children with disabilities went from 2500 to 4000, indicating a 60% increase (Tan, 2016) in identification of children eligible for EI services. However, developmental screening has traditionally been considered the responsibility of only health care providers. For example, all newborns and their parents in Singapore receive a child Health Booklet, which contains a developmental checklist for primary health care to monitor child growth and development from birth to four years (Poon & Lim, 2012). This Health Booklet collects information about a child’s physical growth, oral health, immunization, and medical history, in addition to a developmental checklist adapted from the Denver Developmental Screening Test – II (Lim et al., 1996).

A recent survey study reported that only one in four parents attended the developmental monitoring visit as required on the Health Booklet (Koh et al., 2016). This low follow-through rate may help explain the relatively late age of referral to intervention services mentioned above (35.8 months in Singapore, compared to 15.5 months in the US, as stated in the Enabling Masterplan Steering Committee, 2011). Another possible reason for the low

follow-through rate of the developmental checklist in the Health Booklet may be that the developmental checklist in the Health Booklet is available in English only. In Singapore, only 36.9% families use English as the primary language, while 34.9% use Mandarin, 12.2% use Chinese dialects, 10.7% use Malay, 3.3% use Tamil, and 2.0% use others (Department of Statistics Singapore, 2016). Research indicated the importance of conducting developmental assessment in the language that a child most frequently used at home (Espinosa, 2010).

As new EI programs developed, developmental screening has expanded from the healthcare sector to the early childhood care and education sector. The Developmental Support Program (DSP) is a newly emerged program implemented in some preschools and childcare centers in Singapore that aims to support children at risk or with disabilities in an inclusive setting. The DSP staff plays an important role in practicing developmental screening. Any children flagged by a classroom teacher for developmental concerns are referred to a DSP specialist for a formal screening using the Brigance Early Childhood Screens III ([Brigance Screens], Brigance & French, 2013). The Brigance Screens (Brigance & French, 2013) is a developmental screening measure developed in the U.S. It covers physical development, language, academic/cognitive, self-help, and social-emotional skills. To date, no research was found in examining and validating the Brigance Screens in the Singapore cultural context. Meanwhile, the classroom teacher completes an ecological congruence assessment ([ECA], Wolery, Brashers, & Neitzel, 2002) and works with the DSP specialist to develop immediate intervention plans in the preschool classroom. The ECA was not developed for developmental screening or eligibility evaluation purposes. It is a tool for early childhood educators to identify and modify intervention goals in preschool classrooms (Wolery et al., 2002). Once the concern is confirmed, parents are advised to take the child for a comprehensive developmental assessment by a multidisciplinary team of specialists from one of the two hospital-based Child Development Units in the whole country to determine whether the child is eligible for EI services (Ho, 2018). This assessment investigates the child's development in a number of domains, such as vision/hearing, motor, cognition, communication, social-emotional and adaptive skills, as well as possible causes for the delay. Standardized tests, play-based assessment procedures, behavioral checklists, direct observations, criterion-referenced instruments, and clinical

judgements are involved (Ho, 2018), yet it is unknown what specific instruments are used in this eligibility determination procedure.

Overall, the process of identifying a child with disabilities still relies heavily on the healthcare system in Singapore. Teachers have started to be involved as intervention programs are being rolled out in preschools and childcare centers. However, no formal screening tool is required for classroom teachers to identify children and refer them for the screening by DSP specialists. This may be a problematic component in the EI system. Inaccurate referrals by classroom teachers may result in many children who indeed do not need intervention services receiving the resource-intensive eligibility evaluation services while other children who actually should receive intervention are overlooked (McLean, Wolery, & Bailey, 2003). Families play an important role in the early identification system; however limited information has been reported on active parent involvement in the assessment procedures.

Taiwan

In Taiwan, there are approximately 1.3 million children between birth and age five, and about 2% of these children (i.e., approximately 26,000) were suspected to have developmental delays and were referred for further evaluation (Department of Statistics, Ministry of Health and Welfare, 2019). Ministry of Health and Welfare of Taiwan,(2015) defines “developmental delays” as “children under six years old who have received a diagnosis given by government certified child developmental clinic indicating delays in cognitive, communication, motor, social-emotional, and adaptive domains.” Once a child is diagnosed with developmental delays or other developmental disabilities, EI/ECSE services will be provided at no cost to the child and his or her family. The same legislation then defined EI/ECSE services as “the therapeutic, educational, consultation, referral, placement, and other relevant services and care provided by a collaborative team to children with disabilities under the age of six and their families based on their individualized needs (Ministry of Health and Welfare of Taiwan, 2015).”

Legal foundations

With the efforts of several social welfare non-profit organizations, in 1991 the central government announced a six-year plan to improve early childhood education, and a five-year plan specifically focused on improving special education for children. These two initiatives formed the basis for establishing EI/ECSE services in Taiwan. Child-related legislation was then amended and served as the foundation for this system in 1993 (Chen, Wu, & Yang, 2007; Huang & Chiang, 2006; Shen, 2009). In 1997, the Taiwanese government developed “The Plan for the Development of Early Intervention Services for Children with Developmental Delay” and further identified the four major components of the EI/ECSE service system as *screening and detection, report and referral, team evaluation, and intervention service* (Huang, 2007).

Several major laws, including The Protection of Children and Youths Welfare and Rights Act and its Bylaws, the Special Education Act and its Bylaws, the People with Disabilities Rights Protection Act and its Bylaws, set the legal ground for children with or without disabilities and their families to receive developmental screening, comprehensive evaluation, subsidized EI/ECSE, and special education services from central and local governments, and mandate that family should be fully included (e.g., serving as a member of the educational evaluation team) in the process of EI/ECSE. The laws also dictate that services provided should be individualized and multidisciplinary so that the unique needs of children and their families can be met (Ho, 2009; Huang & Chiang, 2006). Additionally, children should receive education in a placement (e.g., home, daycare centers, preschool, hospitals, or special education schools) that best accommodate their needs, with meaningful inclusion and maximum accessibility to daily routines and activities (The R.O.C Laws & Regulations Database, Ministry of Justice, 2019). EI/ECSE accountability is maintained by yearly program evaluation.

In 2016, the Social and Family Affairs Administration of the Ministry of Health and Welfare announced an implementation plan of community-based EI/ECSE services for at risk children and children with developmental delays. The intention of this implementation plan was to integrate the existing home-based and community-based intervention services for children with disabilities and their families so that resources can be well coordinated and distributed (Liao et al., 2016; The Social and Family Affairs Administration of Taiwan,

2016). This plan detailed individualized child and family support services (e.g., parent support groups, counseling services), and also described the community partnerships and prevention services that can be provided.

Procedures and practices

With support from governmental policy (i.e., The Enforcement Plan of EI/ECSE for Children with Developmental Delays), the Department of Health under Executive Yuan (equal to Department of State in the U.S.) has established a universal developmental screening system for children from birth to age six. The system is to help achieve the goal of early referral and early identification in Taiwan (Ho, 2009). Besides newborn hearing screening and Congenital Metabolic Disorder screening (including phenylketonuria; PKU) performed by the hospital clinics (Health Promotion Administration, Ministry of Health and Welfare of Taiwan, 2016; Hu, Jian, & Li, 2010), non-profit organizations also provide itinerant screening services to parents in order to advocate for the importance of staying alert to their children's development. Commonly used developmental screening tools include the Taipei City Developmental Screening Checklist for Preschoolers – Second Version, Denver Developmental Screening Test, and Denver Developmental Screening Test – II.

Each city/county has established an EI/ECSE coordination agency and a case management center that advocates for and administers developmental screening, accepts referrals, serves as a liaison between different programs and service providers, manages cases, and provides resources (Huang, 2007). If caregivers (i.e., parents and professionals) suspect a child may have a potential developmental delay, they refer this child to the coordination agency. The child is then transferred to the child developmental evaluation clinic and is further evaluated by a multidisciplinary medical team (e.g., developmental pediatrician, clinical psychologist, physical therapist). Eligibility is determined using standardized diagnostic assessments (e.g., Bayley Scales of Infant and Toddler Development – Third Edition, Mullen Scales of Early Learning, Chinese Child Development Inventory, Adaptive Behavior Assessment System – Second Edition) and clinical opinions. If the child qualifies for EI/ECSE services, with parental input, a committee from the coordination agency selects the most inclusive learning environment

for this child and creates an Individual Family Service Plan (IFSP), an Individual Service Plan (ISP), or an Individualized Education Plan (IEP) (Liao & Wu, 2017). Additionally, healthcare professionals have increasingly been using the Children and International Classification of Functioning, Disability – Children and Youth version, mandated by the People with Disabilities Rights Protection Act (2015), to determine a child's eligibility for receiving disability benefits under this Act (Pan, Hwang, Simeonsson, Lu, & Liao, 2014).

Current EI/ECSE practices involve medical, educational, and social welfare services (Chang, 2009; Huang & Chiang, 2006; Kang, Lovett, & Haring, 2002). Children with disabilities receive EI/ECSE services through two systems: The Ministry of Education and the Ministry of Health and Welfare (Liao & Wu, 2017). The different types of services received include home-based intervention, clinical-based intervention, and community/childcare-based intervention (Department of Statistics, Ministry of Health and Welfare, 2019). With inclusive early childhood programs being first experimented with in the 1980s, increasing numbers of children are being served in early childhood education settings (Liao & Wu, 2017). There is also an ample amount of research examining the effects of inclusion on the development of children, as well as pre-service and in-service professionals' attitudes, beliefs, and training serving children in inclusive settings (e.g., Liu & Tseng, 2012; The National Special Needs Education Longitudinal Study, 2009; Tseng, 2018). These indicate that meaningful inclusion (i.e., children being able to participate in classroom and community activities and teachers having the knowledge and skills to promote interaction between children with and without disabilities) is being promoted in Taiwan.

Additionally, the traditional service model primarily has a child-centered focus and family involvement appears to be passive, which means that professionals are the primary decision makers during the goal selection and intervention process and parents do not have sufficient opportunities to share their thoughts (Hsieh, Hsieh, & Lee, 2016; Hsieh, Lee, & Hsieh, 2018; Hwang, Chao, & Liu, 2013). To acknowledge the important role of parents, a routine- or activity-based, family-centered approach has been advocated so that community resources can be fully integrated and utilized in the provision of services to meet the needs of children with disabilities and their families. Professionals are also strongly encouraged to provide parental support so that parents feel they are being well supported throughout the

process (Hsu, Chang, & Wang, 2006; Liu, 2018).

Turkey

Lack of valid, reliable, and disaggregated data on the up-to-date child population with disabilities in Turkey pretenses a significant problem. Based on the available official statistics, it is estimated that there were 1,105,630 individuals with disabilities aged between birth and 19 years in Turkey. According to the general population statistics 690,000 of that population consisted of children (birth–six years old) with disabilities (Education Reform Initiative, 2016).

Legal foundations

In Turkey, EI/ECSE services are carried out through multifaceted legal arrangements. According to the Special Education Law 573, services to children should be provided as soon as possible (Ministry of National Education [MoNE], 2011). According to the Law 573, a person with a disability is defined as a person with significant difference from the levels expected compared to their peers in terms of personal characteristics and educational proficiency due to a variety of reasons. MoNE Special Education Services Legislation presents detailed information on EI/ECSE services (Koch, Ozdemir, & Akkose, 2014; Meral & Turnbull, 2014). Special education services are organized and provided by the Guidance and Research Centers (GRC) which are affiliated to the MoNE and established in a majority of provincial and district directorates. Preschool inclusion became more widespread in 2006 with the adoption of a special education services regulation (MoNE, 2013). Moreover, international organizations, such as United Nations Children’s Fund (UNICEF), support the development of educational materials and training programs to support the inclusion of children with disabilities through mainstream early childhood education (UNICEF, 2017b).

Procedures and practices

Developmental assessment and diagnosis are mostly conducted by healthcare providers. Newborn screening is available in healthcare centers. However, a systematic nationwide

developmental screening has not been established for children (Er-Sabuncuoglu & Diken, 2010; Kucuker, Kapci, & Uslu, 2011). Timely identification of children is an important challenge in Turkey. The process in GRCs is guided by a team of special education teachers, counselor teachers, and/or social service specialists. A special education assessment council provides the educational assessment, diagnosis, placement, and monitoring service for children with disabilities in GRCs. Currently, if EI eligibility is not diagnosed by birth, children can be identified in two main ways: 1) during a healthcare visit, the healthcare provider may identify child's disability, or 2) preschool and/or higher grade teachers may guide the parents to a GRC and the GRC team can identify the child.

The commonly used developmental screening tools are: 1) ASQ (Adapted by Kapci, Kucuker, & Uslu, 2010); 2) ASQ:SE (Adapted by Kucuker, Kapci, & Uslu, 2011); 3) Gazi Early Childhood Development Assessment Scale ([GECIDAS], Temel, Ersoy, Avci & Turla, 2005); 4) Vineland Adaptive Behavior Scales (Adapted by Alpas & Akcakin, 2003; Sparrow, Balla, Cicchetti, Harrison, & Doll, 1984); 5) Denver II (Adapted by Anlar & Yalaz, 1995); and 6) Ankara Developmental Screening Inventory ([ADSI], Savasir, Sezgin & Erol, 1993). Moreover, there are a few parent-completed tools focusing on social-emotional development: 1) Child Behavior Checklist (Adapted by Erol, Kilic, Ulusoy, Kececi, & Simsek, 1998); 2) The Brief Infant-Toddler Social Emotional Assessment (Adapted by Karabekiroglu et al., 2009); and 3) The Conners Parent Rating Scales - Revised - Short (Adapted by Kaner, Buyukozturk, & Iseri, 2007). It should be noted that these parent-completed tools are not applicable for infants (birth-12 months) in Turkey.

According to the Special Education Services Legislation, ECSE services are provided to children from birth to 72 months (MoNE, 2013). These services are grouped into the early childhood period (birth-36 months), and the preschool period (37-72 months). Early childhood education is for children who are 37-66 months old. The special education services board places the child with disabilities in a public school or an institution for children with disabilities, based on the GRC's assessment report. The number of available public inclusive early childhood programs is very limited. In other words, not all programs have an inclusive classroom for children with disabilities. There is an increasing trend towards offering private rehabilitation and special education centers, public regular schools, or public special education schools - institutions for children with disabilities (Er-

Sabuncuoglu & Diken, 2010). Therefore, parents who have limited resources may be less likely to have access to inclusive ECSE classrooms (Meral, 2015). There is no reliable and valid data about the number of educators providing services to these children in inclusive preschool programs.

Discussion

The aim of the review was to provide evidence on legal foundations, procedures with a focus on identification and assessment of children, and education services for children with disabilities and their families in four settings. Based on peer-reviewed articles and governmental reports, this review revealed some important similarities as well as differences across settings.

Legal Foundations

Laws and regulations focused on EI/ECSE exist in all settings with a focus on the importance of providing timely services and inclusive education to children with disabilities. Based on the review, it appears that Western literature has influenced the development of EI/ECSE research in these four settings. For instance, many of the assessment tools are translated from Western studies. However, there are discrepancies between the existing laws and practices in the field. For instance, although inclusive ECSE is supported by law, there are very limited inclusive ECSE classrooms for children with disabilities in Turkey (Er-Sabuncuoglu & Diken, 2010; Meral & Turnbull, 2014). Furthermore, with increasing awareness of the value of EI/ECSE, the federal government of China is taking action to improve the EI/ECSE system. Serving such a large population, it is essential to ensure that related laws and policies are implemented with available funding and resources (Zheng, Maude, & Brotherson, 2015).

Identification and Assessment

An important step in the field of EI/ECSE is the diagnostic process. In all settings, the

health care system appears to be the primary source for families to share their concerns regarding their child's development and learning. However, there are significant differences regarding the diagnostic procedures. For instance, in Taiwan, the diagnostic procedures vary significantly across clinics when evaluating children, and there are discrepancies in trained professionals and resources among urban, suburban, and rural areas.

It appears that the importance of timely identification and referral to related EI/ECSE services has been recognized in all settings. However, except in Taiwan, there is a lack of nationwide early screening systems available. Although a universal developmental screening system has been established and efforts were put into increasing the awareness of age appropriate developmental milestones, Taiwan, like other settings, is still in need of technically sound screening tools that are comprehensive, family-friendly, and cost effective. Researchers suggested that a comprehensive screening system with a broad range of disabilities is an important first step to EI services (Zheng, Maude, & Brotherson, 2015). Moreover, professionals, such as early childhood educators and social workers, should be included in this system. EI/ECSE practitioners' professional development should be supported in all settings.

Moreover, there is a lack of monitoring and tracking progress of children and families who receive EI/ECSE services in all settings. For instance, in Taiwan and Turkey, children receive EI/ECSE services or private therapies in various formats (e.g., one-on-one, small or large group) across different settings (e.g., a clinic, at home, or a center-based setting). This approach creates a challenge to properly monitor a child's progress and demonstrate program accountability, especially considering the variability in training received to make data-based decisions and a lack of interagency collaboration. No sustainable suggestions for resolving this problem have been specified in the reviewed literature.

There is a positive, increasing trend towards translating and adapting Western-based assessment tools. However, in some settings (i.e., Singapore and Turkey), translated tools are used by professionals only, whereas in the original setting that the tool is developed, it can be administered by caregivers or preschool teachers. Furthermore, in all settings, the current tools are in need of an updated normative sample. Further research should be devoted to advancing the screening and diagnosis tools with attention to cultural and linguistic adaptation in all settings. Verbatim translation of assessment tools do not provide

accurate profile of a child's potential. Differences in syntax between languages, as well as the cultural familiarity of the toys and items in an assessment tool should be considered during the adaptation process. For instance, similar to the other settings in this review, the two developmental screening tools being used in Singapore (i.e., the Denver Developmental Screening Test – II and Brigance Early Childhood Screens III) are both lacking the evidence of cultural sensitivity and psychometric rigor for children in Singapore. To date, there is no information found in the literature about what instruments are being used in the EI/ECSE eligibility evaluation (i.e., diagnosing a disability) in Singapore. Future research is needed to examine the developmental assessment measures in practice as well as to develop instruments that are culturally and psychometrically sound for the population.

Education Services

Several challenges were noted regarding the availability and accessibility of services for children with disabilities and their families. For instance, in China and Turkey, there is a lack of early interventionists and ECSE teachers in the field. In China, only a handful of normal (education) colleges and universities provide teacher training services, but the program of study is not up-to-date. Resources should be prioritized to support personnel preparation and utilize technology to disseminate evidence-based practices to teachers and families in all settings. Similarly, in Singapore, resources should be allocated to prepare early childhood educators for playing an active role in the developmental screening network as described in the EM (Enabling Masterplan Steering Committee, 2016).

In Taiwan, hospital clinics and EI/ECSE programs are working on shifting the evaluation and intervention focus from a child-centered approach to a family-centered approach. Due to differences in family comfort level and capacity, as well as professionals' beliefs, training, practices, and professional development opportunities are still needed to promote family participation and achieve successful family-professional partnerships.

It should be noted that in some settings (i.e., China, Singapore, and Turkey), caregivers may not share their concerns regarding their child's development and learning or may not be familiar with the EI/ECSE services. The role of family needs to be examined to identify

effective practices and gaps in supporting family involvement in the assessment and evaluation process. For instance, in Singapore, although parents are expected to take the initiative to complete the developmental checklist in the Health Booklet and follow up on their child's developmental screening, the low follow-through rate reported in the literature (Koh et al., 2016) suggests that this current practice needs to be reviewed and revised. There is a need for training of practitioners on assessment and collaboration with families in all settings.

Limitations

This study has some limitations. This review should not be viewed as a general resource for EI/ECSE disability or for specific developmental disabilities, such as ASD or Down syndrome. These topics deserve specific attention beyond the scope of this review. Where relevant and possible, reference is made to other reviews or documents on these topics. Another limitation of this study is the determination of the quality of studies. There is no uniform definition of disability with classification and age group of children, and this often leads to confusion about what constitutes a disability. Methodologies used across settings are inconsistent when collecting this type of information. Disability attributes could be measured with different methods and not be comparable across settings. Oftentimes there is still a stigma related to having a disability, and therefore its prevalence may be under-reported. For instance, in some strong traditional Turkish communities, families may perceive disability as a shame and not reach out for services. These factors make it difficult to determine the extent of exclusion and to identify children with proper policies and procedures.

Conclusion

There are various components and embedded patterns in each setting's EI/ECSE systems. Thus, there is no one way to establish and improve a nationwide EI/ECSE system to serve children and their families. The findings underscore the need to strengthen and

improve current EI/ECSE systems in four settings. Due to obstacles in terms of assessment and implementation of family-centered practices, the general preference seems to be supportive of timely assessment and inclusive early childhood education. There is a need for a coordinated, multidisciplinary, and sustainable initiatives focusing on the assessment of young children to provide timely EI/ECSE services.

References

- Alpas, B., & Akcakin, M. (2003). Vineland adaptive behavior scales (survey form): Adaptation, validity and reliability for infants of 0-47 months of age. *Turkish Journal of Psychology, 18*, 57-71.
- Anlar, B., & Yalaz, K. (1995). *Denver gelişimsel tarama testinin Türk çocuklarına uyarlanması ve standardizasyonu* [Denver developmental screening test's adaptation and standardization to Turkish children]. Ankara, Turkey: Meteksan AS.
- Bian, X., Xie, H., Squires, J., & Chen, C. Y. (2017). Adapting a parent-completed, socioemotional questionnaire in China: The ages & stages questionnaires: social-emotional. *Infant Mental Health Journal, 38*(2), 258-266.
- Bricker, D., Macy, M., Squires, J., & Marks, K. (2013). *Developmental screening in your community: An integrated approach for connecting children with services*. Baltimore, MD: Paul H. Brookes Publishing.
- Brigance, A., & French, B. (2013). *Brigance early childhood screens III*. North Billerica, MA: Curriculum Associates.
- Chang, S. Y. (2009). Examining the role of a social worker in the early intervention professional team. *Community Development Quarterly, 125*, 343-355.
- Chen, Y.C., Wu, M.S., & Yang, Y.S. (2007). *Early intervention*. Taipei City, Taiwan: Farseeing Publishing Group.
- China Disabled Persons' Federation. (2011). *Report of the first summit conference of autism in China*. Unpublished work. Beijing, China: China Disabled Persons' Federation.
- China Disabled Persons' Federation. (2006). *Report on numbers of persons with disabilities*

- in China*. Retrieved from http://news.xinhuanet.com/politics/2006-12/01/content_5419388.htm
- Deng, M., Poon-Mcbrayer, K. F., & Farnsworth, E. B. (2001). The development of special education in China: A sociocultural review. *Remedial and Special Education, 22*(5), 288-298.
- Department of Statistics, Ministry of Health and Welfare. (2019). *Number of units taking in children with developmental problems for early intervention services and number of persons being taken in*. Retrieved from <https://dep.mohw.gov.tw/DOS/lp-2978-113.html>
- Department of Statistics Singapore. (2016). *General household survey 2015*. Retrieved from <https://www.singstat.gov.sg/-/media/files/publications/ghs/ghs2015/ghs2015.pdf>
- Department of Statistics Singapore. (2018). *Singapore in figures 2018*. Retrieved from <https://www.singstat.gov.sg/-/media/files/publications/reference/sif2018.pdf>
- Early Childhood Development Agency of Singapore. (2017). *About us*. Retrieved from <https://www.ecda.gov.sg/pages/aboutus.aspx>
- Education Reform Initiative. (2016). *The right of children with disabilities to education: Situation analysis and recommendations for Turkey*. Retrieved from http://en.egitimreformugirisimi.org/wp-content/uploads/2017/03/UnicefOzelGereksinimliRaporENG.08.06.16.web_.pdf
- Eichner, J. C., Groark, C., & Palmov, O. (2011). Early intervention: International policies and program. In C. Groark (Ed.), *Early childhood intervention: Shaping the future for children with special needs and their families* (pp. 37-70). Santa Barbara, CA: ABC-CLIO/Praeger.
- Ellsworth, N. J., & Zhang, C. (2007). Progress and challenges in China's special education development: Observations, reflections, and recommendations. *Remedial and Special Education, 28*(1), 58-64.
- Enabling Masterplan Steering Committee. (2011). *Masterplan (2012-2016)*. Retrieved from <https://www.ncss.gov.sg/NCSS/media/NCSS-Documents-and-Forms/Enabling-Masterplan-2012-2016-Report-%288-Mar%29-%28EM2%29.pdf>
- Enabling Masterplan Steering Committee. (2016). *Enabling masterplan 2017–2021: Caring nation, inclusive society*. Retrieved from <http://eservice.nlb.gov.sg/>

data2/BookSG/publish/d/dda160d8-1259-4a94-8923-80d35244041b/web/html5/index.html?opf=tablet/BOOKSG.xml&launchlogo=tablet/BOOKSG_BrandingLogo_.png&pn=5

- Erol, N., Kılıç, C., Ulusoy, M., Keçeci, M., & Şimşek, Z. (1998). *Türkiye Ruh Sağlığı Profili Raporu* [Report of mental health profile of Turkey]. Ankara, Turkey: Eksen Tanıtım Ltd Şti.
- Er-Sabuncuoğlu, M., & Diken, I. H. (2010). Early childhood intervention in Turkey: Current situation, challenges and suggestions. *International Journal of Early Childhood Special Education*, 2(2), 149-160.
- Espinosa, L. (2010). *Getting it right for young children from diverse backgrounds*. Boston, MA: Pearson Learning Solutions.
- Health Promotion Administration, Ministry of Health and Welfare of Taiwan. (2016). *The first line of defense for health: Three decades of newborn screening in Taiwan*. Retrieved from <https://www.hpa.gov.tw/EngPages/Detail.aspx?nodeid=1307&pid=7179>
- Ho, L. (2018). *Building an inclusive early childhood intervention ecosystem in Singapore*. KK Women's and Children's Hospital. Retrieved from <http://www.nlb.gov.sg/biblio/203165627>
- Ho, W. K. (2009). Examining the evaluation system of early intervention in Taiwan. *Early Childhood Education Research*, 1, 1-32
- Hsieh, R. L., Hsieh, W. H., & Lee, W. C. (2016). Short-term family-centered workshop for children with developmental delays enhances family functioning and satisfaction: A prospective clinical trial. *Medicine*, 95, e4200-e4205. doi: 10.1097/MD.0000000000004200.
- Hsieh, W. H., Lee, W. C., & Hsieh, R. L. (2018). Effects of a family-centered workshop of children with developmental delays. *Medicine*, 97, e12106-e12113. doi: 10.1097/MD.00000000000012106
- Hsu, S. P., Chang N., & Wang, W. Y. (2006). The analysis and evaluation of support group for parents with young children with disabilities: The case of pilot parent program. *NTU Social Work Review*, 13, 1-40.
- Hu, B. Y. (2010). The enlightenment of the quality assessment of kindergartens' learning

- environment on inclusive education. *Chinese Journal of Special Education*, 123(9), 9-15.
- Hu, W. L., Jian, Y. X., & Li, N. Z. (2010). Newborn screening. *Formosan Journal of Medicine*, 14, 34-38.
- Hu, X., & Yang, X. (2013). Early intervention practices in China: Present situation and future directions. *Infants & Young Children*, 26(1), 4-16.
- Huang, L. C., & Chiang, L. C. (2006). The existing state of early intervention in Taiwan: A discussion on the role of health professionals. *The Nursing Journal of the Veterans General Hospital*, 23, 219-226.
- Huang, P. H. (2007). The development and current situation of the early intervention for children with developmental delay in Taiwan. *International Journal of Child Care and Education Policy*, 1, 45-58.
- Hwang, A. W., Chao, M. Y., & Liu, S. W. (2013). A randomized controlled trial of routine-based early intervention for children with or at risk for developmental delay. *Research in Developmental Disabilities*, 34(10), 3112-3123.
- Kaner, S., Buyukozturk, S., & Iseri, E. (2013). Connors anababa dereceleme olcegi-yenilenmis kisa: Turkiye stardardizasyon calismasi [Connors parent rating scale-revised short: Turkish standardization study]. *Archives of Neuropsychiatry*, 50(2), 100-110.
- Kang, Y. S., Lovett, D., & Haring, K. (2002). Culture and special education in Taiwan. *TEACHING Exceptional Children*, 34(5), 12-15.
- Karabekiroglu, K., Rodopman-Arman, A., Ay, P., Ozkesen, M., Akbas, S., Tasdemir, G. N., ... Peksen, Y. (2009). The reliability and validity of the Turkish version of the brief infant-toddler social emotional assessment. *Infant Behavior & Development*, 32(3), 291-297.
- Kapci, E. G., Kucuker, S., & Uslu, R. I. (2010). How applicable are ages and stages questionnaires for use with Turkish children? *Topics in Early Childhood Special Education*, 30(3), 176-188.
- Koch, K. R., Ozdemir, O., & Akkose, M. C. (2014). Enhancing early intervention services for children with special needs in the middle east: A Turkish initiative. *International Journal of Early Childhood Special Education*, 6(1), 143-150.

- Koh, H. C., Ang, S. K. T., Kwok, J., Tang, H. N., Wong, C. M., Daniel, L. M., ... Goh, W. (2016). The utility of developmental checklists in parent-held health records in Singapore. *Journal of Developmental & Behavioral Pediatrics, 37*(8), 647-656.
- Kucuker, S., Kapci, E. G., & Uslu, R. I. (2011). Evaluation of the Turkish version of the "ages and stages questionnaires: Social-emotional" in identifying children with social-emotional problems. *Infants & Young Children, 24*(2), 207-220.
- Liao, H. F., Lin, H. F., Yang, M. H., Su, H. C., Lin, M. Y., Chen, S. L., ... Kuo, H. T. (2016). *The handbook of community-based childhood early intervention development and content*. Retrieved from http://www.wjy.org.tw/j20r_ext/public/ebook/ebbok_006/HTML5/pc.html#/page/2
- Liao, H. F., & Wu, P. F. (2017). Early childhood inclusion in Taiwan. *Infants and Young Children, 30*(4), 320-327. doi: 10.1097/IYC.000000000000102
- Lim, H. C., Ho, L. Y., Goh, L. H., Ling, S. L., Heng, R., & Po, G. L. (1996). The field testing of Denver developmental screening test Singapore: A Singapore version of Denver II developmental screening test. *Annals of the Academy of Medicine, Singapore, 25*(2), 200-209.
- Liu, K., & Tseng, S. H. (2012). 循著中介系統的脈絡來探討特教與幼教老師在自然情境中的合作歷程 [Collaborative process between itinerant special education teachers and preschool teachers from the mesosystem perspective]. *特殊教育研究學刊 [Bulletin of Special Education], 37*(2), 1-27. doi: 10.6172/BSE201207.3702001
- Liu, K. (2018). A parent-to-parent program in Taiwan. *Infants and Young Children, 31*(2), 157-174. doi: <https://doi.org/10.1097/IYC.0000000000000114>
- McLean, M., Wolery, M., & Bailey, D. (2003). *Assessing infants and preschoolers with special needs* (3rd ed.). Upper Saddle River, NJ: Person, Merrill Prentice Hall.
- Meral, B. F. (2015). Obstacles to special education for students with intellectual disabilities in Turkey: A brief report. *European Journal of Special Needs Education, 30*(1), 93-105.
- Meral, B. F., & Turnbull, H. R. (2014). Analysis of special education policy in Turkey and United States: Improving Turkey's policy for students with intellectual disability. *Journal of Policy and Practice in Intellectual Disabilities, 11*(3), 165-175.
- Ministry of Health and Welfare of Taiwan. (2015). *The protection of children and youths*

- welfare and rights act*. Retrieved from <https://law.moj.gov.tw/LawClass/LawAll.aspx?pcode=D0050001>
- Ministry of Health and Welfare of Taiwan. (2015). *People with disabilities rights protection act*. Retrieved from <https://law.moj.gov.tw/ENG/LawClass/LawAll.aspx?pcode=D0050046>
- Ministry of National Education. (2011). *Okul oncesi egitimin yayginlastirilmasi* [Expanding and improving preschool education]. Retrieved from <http://mevzuat.meb.gov.tr/dosyalar/1442.pdf>
- Ministry of National Education. (2013). *Milli Egitim Bakanligi Temel Egitim Genel Mudurlugu Okul Oncesi Egitim Programi* [Ministry of National Education general directorate of primary education preschool education program]. Retrieved from <https://tegm.meb.gov.tr/dosya/okuloncesi/ooproram.pdf>
- Ministry of National Education. (2013). *Özel Eğitim Hizmetleri Yönetmeliği* [Regulation of special education services]. Retrieved from <http://mevzuat.meb.gov.tr/dosyalar/1963.pdf>
- National People's Congress. (1990). *The law of the people's republic of China on protection of persons with disabilities*. Retrieved from http://news.xinhuanet.com/newscenter/2008-04/24/content_8044571.htm
- Pan, Y. L., Hwang, A. W., Simeonsson, R. J., Lu, L., & Liao, H. F. (2014). ICF-CY Code Set for infants with early delay and disabilities (EDD Code Set) for interdisciplinary assessment: A global experts survey. *Disability and Rehabilitation, 21*, 1-11.
- Pang, Y., Lee, C. M., Wright, M., Shen, J., Shen, B., & Bo, J. (2018). Challenges of case identification and diagnosis of autism spectrum disorders in China: A critical review of procedures, assessment, and diagnostic criteria. *Research in Autism Spectrum Disorders, 53*, 53-66.
- Poon, K. K., & Lim, A. K. (2012). Current provision, recent developments, and future directions for early childhood intervention in Singapore. *Infants & Young Children, 25*(4), 323-333.
- Savasir, I., Sezgin, N., & Erol, N. (1993). *Ankara Gelişim Tarama Envanteri* [Ankara developmental screening inventory] (2nd Ed.). Ankara, Turkey: Turkish Psychological Association.

- Shen, M.C. (2009). *A comparative study on the policies of early intervention for children with disabilities between Taiwan and U.S.A.* (Unpublished master's thesis). National Chi Nan University, Taiwan.
- Sparrow, S. S., Balla, D. A., Cicchetti, D. V., Harrison, P. L., & Doll, E. A. (1984). *Vineland adaptive behavior scales*. Circle Pines, MN: American Guidance.
- Tan, T. (2016, May 19). *More children diagnosed with developmental problems*. *The Straits Times*. Retrieved from <https://www.straitstimes.com/singapore/more-children-diagnosed-with-developmental-problems>
- Temel, F., Ersoy, O., Avci, N., & Turla, A. (2005). *Gazi Erken Çocukluk Gelişimi Değerlendirme Aracı* [Gazi Early Childhood Development Assessment Scale]. Ankara, Turkey: Remay.
- The National Special Needs Education Longitudinal Study (2009). *Special needs education longitudinal study (SNELS): Preschool questionnaires in the school year of 2009*. Retrieved from https://srda.sinica.edu.tw/datasearch_detail.php?id=1148
- The R.O.C Laws & Regulations Database, Ministry of Justice. (2019). *Special education act*. Retrieved from <https://law.moj.gov.tw/LawClass/LawAll.aspx?pcode=H0080027>
- The Social and Family Affairs Administration of Taiwan. (2016). *An implementation plan of community-based early intervention services for children at risk for or with developmental delays*. Retrieved from https://www.sfaa.gov.tw/SFAA/File/Attach/5198/File_167132.pdf
- Tseng, S. H. (2018). Preschool inclusion placement in Taiwan. *Asian-Pacific Journal of Research in Early Childhood Education*, 12(3), 69-91.
- United Nations International Children's Emergency Fund. (2017a). *Disabilities*. Retrieved from <https://www.unicef.org/disabilities/>
- United Nations International Children's Emergency Fund. (2017b). *UNICEF annual report 2017*. Retrieved from https://www.unicef.org/about/annualreport/files/Turkey_2017_COAR.pdf
- Wolery, M., Sigalove Brashers, M., & Neitzel, J. C. (2002). Ecological congruence assessment for classroom activities and routines: Identifying goals and intervention practices in childcare. *Topics in Early Childhood Special Education*, 22(3), 131-142.
- World Health Organization. (2018). *Early childhood development*. Retrieved from

<https://www.who.int/topics/early-child-development/en/>

- Xie, Z. H., Bo, S. Y., Zhang, X. T., Liu, M., Zhang, Z. X., Yang, X. I., ... Wu, Z. I. (2008). Sampling survey on intellectual disability in 0~6-year-old children in China. *Journal of Intellectual Disability Research*, 52(12), 1029-1038.
- Zhang, F. J., & Yang, F. Y. (2011). *Early intervention to children with disabilities*. Shanghai, China: East China Normal University Publishing House.
- Zhang, M. L., Chen, L., Wang, H., & Li, X. Q. (2009). Diagnosis of children with autism in medical and rehabilitation services in China. *Chinese Journal of Special Education*, 110(8), 35-39.
- Zheng, Y., Maude, S. P., & Brotherson, M. J. (2015). Early childhood intervention in China. *Journal of International Special Needs Education*, 18(1), 29-39.
- Zhou, B., & Xu, X. (2019). Progress and challenges in early intervention of autism spectrum disorder in China. *Pediatric Medicine*, 2(26), 1-14.