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Adapting and validating a developmental assessment for chinese infants and toddlers: The ages & stages questionnaires: Inventory



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ABSTRACT

The Chinese government has announced the 2013 Guidelines for developing a national system for early detection of disability among children under 6 years of age. However, given limited resources, challenges exist with developmental measures required in the 2013 Guidelines. In order to meet the needs for a more accurate and cost-efficient measure for developmental assessment, the Ages & Stages Questionnaires: Inventory (ASQ:I) was translated into Simplified Chinese, and validated on a regional sample of 812 Chinese children ages from 1 to 25 months. Results indicated that the Chinese ASQ:I domain scores increased across children's age. When dividing the sample into seven age intervals, Cronbach's alpha in each interval ranged from 0.59 to 0.96 across five domains. When using the whole sample for analyses, item expected a posteriori/plausible value (EAP/PV) reliability was above 0.99 in all domains, test-retest reliability using intra-class correlation analyses ranged from 0.95 to 0.99, and the agreement with the concurrent measure ranged from 0.29 to 0.89. Domain scores on the ASQ:I correctly predicted 92–99% of participating children's disability status. Findings suggested that the Chinese ASQ:I has adequate psychometric properties and thus provides a promising alternative measure for screening and progress monitoring in young children in China. Implications for future research and implementation are discussed.

1. Introduction

According to the most recent government report, the number of young children in China from birth to six years with a documented disability was 1.68 million (China Disabled Persons' Federation, CDPF, 2006) with an estimated annual increase rate of 0.19 million (Hu & Yang, 2013). Access to public rehabilitation and intervention services requires official documentation of disability (Law of the Protection of Persons with Disabilities, 2008), which usually entails a diagnosis from a qualified physician using standardized procedures and assessment tools. Qualified tests include the Chinese Denver Development Screening Test (DDST) for screening, and the Beijing Gesell Developmental Schedule (Beijing GDS) as a diagnostic tool for documenting intellectual disabilities for young children under the age of six years (Chinese Center for Disease Control and Prevention, CCDCP, 2013).

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1.1. Challenges and needs in China

While the acceptance of disability as a natural life occurrence and the awareness of the effectiveness of early intervention services continue to grow, challenges still remain in the Chinese developmental assessment service system. These challenges include 1) insufficient resources to support personnel in the health services industry, 2) a need for high quality developmental assessment instruments that are up-to-date, culturally appropriate, and psychometrically sound, and 3) a lack of family involvement in the evaluation and identification process.

1.1.1. Insufficient resources

In China, assessment of a child's developmental status and whether he/she is eligible for intervention services is the responsibility of pediatricians. However, a typical pediatric doctor's visit is allotted only five minutes, due to physicians' heavy caseloads (Xu & Zhang, 2014; Zhou, Pan, & Hou, 2014). In addition, most clinical professionals have not received training and are not equipped with the knowledge and skills necessary for the appropriate implementation and administration of developmental screening and diagnostic measures. Training on child development and assessment for medical practitioners is a relatively recent phenomenon in China, having only been provided since 2000 in a few medical schools (Jin, 2010). Given the limited supports and a stressful workload, it is not surprising that the staff turnover rate for pediatricians is increasing in China, a trend which is likely to increase the current shortages and exacerbate the need for these important professionals (Xu & Zhang, 2014). Clearly, the administration of standardized assessments within the daily practices of pediatric professionals is not realistic, given their limited training, high clinical caseloads, and the scarcity of resources in China, especially in rural areas (Luo, Gu, Jin, & Hu, 2014).

1.1.2. Need for psychometrically sound and up-to-date assessment instruments

Currently there are only a few developmental screening and diagnostic instruments available in China, most of which are often outdated, inaccurate, or inaccessible to most practitioners. Many developmental assessment tools used to screen, diagnose, and/or monitor young Chinese children are based on normative samples collected in China 20 or 30 years ago (Lin, Li, & Zhang, 1986; Zhu, Lu, Tang, Wang, & Song, 1983; Zhu et al., 1984), such as the two tests required in the 2013 CCDCP Guidelines—the Chinese DDST and the Beijing GDS. The Chinese DDST was translated from English and normed on a Chinese sample in the 1970's and 80's (Zhou et al., 2013). The Beijing GDS was translated from English and standardized on 884 children in Beijing in 1985 (Lin et al., 1986). Updated normative evidence is much needed, especially as the Chinese population and child rearing practices have undergone many changes in the last 30 years. In addition, there is currently no evidence supporting the technical adequacy of either the Chinese DDST or the Beijing GDS.

1.1.3. Lack of family involvement in the assessment process

The early intervention system in China follows a traditional, professional-centered, clinical approach to the delivery of early intervention services, and a transition to a more family-centered approach is very much needed (Hu & Yang, 2013; Jin, 2008). This traditional approach also exists for developmental assessment services. Identification of developmental problems is often hurriedly conducted by medical professionals during a limited timeframe, and parents and caregivers are traditionally excluded from the decision-making process. Valid and reliable instruments are needed in China that are culturally relevant, family friendly (i.e., include parents in the process), and take minimal time to administer. Using naturalistic tests that incorporate parent observation and report in a reliable manner to collect information can be helpful for yielding accurate understanding of the development of infants and young children (Squires, 2015).

1.2. Introducing parent-completed screening tools to China

In order to address some of the shortcomings in the Chinese developmental assessment system described above, one developmental screening tool, the Ages & Stages Questionnaires-Third Edition (ASQ-3; Squires & Bricker, 2009), was translated into Simplified Chinese and a national Chinese normative sample was obtained (Bian, Xie, & Squires, 2014). The ASQ-3 is a parent-completed developmental screening tool that includes 21 questionnaires for specific age intervals from two to 60 months. Thirty scored items within each interval of the ASQ-3 address six age appropriate skills in five developmental domains: Communication, Gross Motor, Fine Motor, Problem Solving, and Personal-social. The Chinese version of the ASQ-3, the ASQ-Chinese (ASQ-C), was studied and published commercially in 2014 (Bian, Chen, & Chen, 2013). An adaptation of the ASQ-C for the Chinese population was conducted following the six steps based on the *International Test Commission (ITC) Guidelines* (ITC, 2010), including translation into the target language (i.e., Simplified Chinese), translation back to source language (i.e., English), evaluation of the equivalence of the source and target versions, identification and adaptation of incorrectly translated/adapted or culturally and linguistically problematic items, pilot testing and resultant modification, and finally establishment of a normative sample to evaluate the distribution of scores and determine potential cut-off scores for the target population. The ASQ-C was pilot tested on 8372 subjects in the Shanghai metropolitan area between 2007 and 2008 (Bian et al., 2014). Results and experiences from the pilot testing facilitated the standardization of the ASQ-C at a national level in 2011 and 2012 (Wei et al., 2015). The ASQ-C sample was stratified on the basis of age, sex, location status (rural/urban), ethnic group, parent education, and annual family income to represent the population of young children ages one to 66 months in China. Psychometric examination with a national sample yielded solid internal consistency (0.51–0.68) and inter-rater reliability (0.79–0.89), and a convergent validity study indicated 84% agreement between screening categorizations for the ASQ-C compared with the Beijing GDS. Most parents who participated in the survey reported that the

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