original article

Early Intervention Tool (EIT) for children with developmental delay: A pilot study

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Children with developmental delay (DD) are at a higher risk for intellectual disabilities (Lakhan, 2013; Shevell, 2010; Shevell, 2008). Intellectual developmental disorder (IDD) (McIntyre & Brown, 2013) is a new word coined for intellectual disabilities in the recent Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-V) (Pynoos, 2013). An intellectual developmental disorder affects an individual's life in terms of self-help care, education, family, occupation and social life (Lakhan, 2013; Wehmeyer & Garner, 2003; Seltzer et al., 2001). Cognitive, communications, motor and social are considered the four main areas of child development. Significant delay in any one area is considered developmental delay. Coexisting conditions such as epilepsy, cerebral palsy, psychiatric disorder are very common with developmental delay and may pose an even higher level of risk for a child becoming intellectually disabled (Kogan et al., 2009) . Early identification and intervention is highly crucial (Singh & Squires, 2014; Lakhen, 2013; Sheldrick et al., 2011; Matson et al., 2010; Shevell, 2010).

DD children face enormous challenges in their lives if not treated on time. Therefore, attempts should be made to recognize such delay and provide early intervention (Girimaji, 2008). Early intervention reduces both the chance of secondary disabilities and increased severity (Singh et al., 2014; Allen, et al., 2013; Bagner et al., 2013; Case-Smith, 2013; Engle et al., 2013; McIntyre & Brown, 2013).

Developmental screening constitutes an ongoing process of monitoring the status of a child by gathering information about development from multiple sources, including skillful direct observation from parents/caregivers and relevant professionals (Squires et al., 1996; Gilbride, 1995). The American Academy of Pediatrics and the British Joint Working Party on Child Health Services recommend developmental screening as an effective means to identify children with developmental delay (Garg & Dworkin, 2011; Shevell, 2010). Developmental screening refers to a brief process of testing in order to identify those who are at risk for developmental delay. Developmental screening identifies those who are in need of further evaluation for eligibility for specialized services (Das et al., 2013; Overton, 2009; Rydz, Shevell, Majnemer, & Oskoui, 2005). For early identification and detection of delays, attention has shifted to developmental screening (Gregoire, & Lucky, 2012). Developmental screening is viewed as a necessary strategy in the primary prevention of developmental disabilities (Katoff & Reuter, 1980).

Currently, early intervention services are being offered in various settings including rehabilitation centers, special schools, community- based rehabilitation projects and child guidance clinics by different rehabilitation professionals. Early intervention can be very specific depending on the nature and severity of developmental delay (Rapee, 2013). Professionals have the ability to choose the

appropriate tools to monitor and evaluate the progress of a DD child, especially if an intervention is targeted towards a particular coexisting condition such as cerebral palsy, communication, cognitive functions, psychiatric disorder etc. There is a need for a simple, reliable, valid, less time consuming and easy to use tool to measure the comprehensive progress of a child with DD in all the domains of development (Moss & Hurley, 2014; Baker et al., 2013; CPNP-PC & Daniels, 2013; Illingworth, 2013). Worldwide prevalence of developmental disabilities has risen in the last decade (CDC, 2013). This increased prevalence demands more infrastructural resources, and professionals to serve the needs of the population. A low and middle-income country such as India does not have the capacity to serve the DD population via a multidisciplinary team. In general, there is huge shortage of trained EIT professionals in India. Available professionals are situated in big towns and cities and they do not prefer to serve in rural communities. In that situation, especially, in rural and more disadvantaged areas of India early intervention services are offered by community based organizations and paraprofessionals in most cases under supervision of trained professionals. Thus, there is a need for an easy, comprehensive and time-efficient tool to measure the progress of a child who is receiving the intervention. (Das & Singh, 2013; Lakhan, 2013; Poon et al., 2010).

The Functional Assessment checklist for programming (FACP), Madras Developmental Program Schedule (MDPs), and Portage guide (Kohli, 1990) are commonly used tools in India. These tools are standardized and very reliable. However their administration in community settings (Dougherty, 2013) is not always feasible due to time constrains, complexity in scoring (Kammerer et al., 2013; Lukersmith, 2013; Nosworthy et al., 2013, Robertson & Blaga, 2013). To address this need in a community based rehabilitation project in Barwani, state of Madhya Pradesh, an Early Intervention Tool (EIT) was developed by the authors.

Objective

The objective is to describe an early intervention tool and its use in measuring the effect of early intervention and assessment for children with developmental delay. EIT includes four domains or developmental areas: (i) physical; (ii) cognitive; (iii) communication; and (iv) social development and is designed to monitor the typical development of children between 3 months to 36 months.

Method

The EIT was developed by the authors in a community based rehabilitation (CBR) project in Barwani, India, which is one of the poorest district in the state of Madhya Pradesh situated in India (Lakhan, 2013). This tool was developed for community based rehabilitation workers, rural health workers, physicians, rehabilitation therapist, social workers, parents and psychologists.

Process of Design and Validation

The items listed on the scale were developed in consultation with a child psychiatrist, a clinical psychologist, a physiotherapist, a speech therapist, an occupational therapist, a medical and psychiatric social worker and a specialist in mental retardation. Millstones from all four areas of development were selected first. These milestones/items were culturally adopted from other standardized tests including the FACP (Narayan, et al., 1990), the Developmental Screening Test (Bharat, 1983), the Vineland Social Maturity Scale (Indian adaptation by Malin; revised by Bharat Raj, 1992), MDPS

(Jeyachandran & Vimala., 2000), Portage Guide (Kohli, 1990), BASIC-MR (Peshawaria & Venkatesan, 1992). These modified test items were placed in lower to higher order and circulated among the professionals. Suggestions and comments were incorporated in finalizing the 14 item scale applicable for children with DD. It is important for a tool to be reliable and valid (Gowen et al., 2012; Fink, 2002). For validation EIT was administered on 19 children (12 tribal and 7 non-tribals) in Barwani and Pati Blocks, of Barwani District in India by community based rehabilitation workers. Other professionals, physiotherapists, occupational therapists and specialists in intellectual disabilities also administered EIT on their clients and provided their feedback. Administration was conducted in different settings. Data obtained on 19 children supports internal consistency and face validity of the tool. Based on the results of these administrations, EIT was found easy to use, less time consuming, reliable and valid. Items listed in the tool were found to simple and easy to understand by non-tribal and tribal parents with and without education. Tribal and non-tribal communities speak two different languages. Tribal community is highly underprivileged, habilitated in disperse hamlets, and heavily relies on traditional faith healing. The tool was administrable on both populations. The results were comparable to other standardized early intervention instruments: Functional Assessment Checklist for Programming FACP (Narayan et al., 1990), Portage Guide Indian adaptation (Pratibha, 2013; Kohli, 1990), and Language Assessment Tool (Subbarao, 1990).

Results

EIT contains 14-items (see Appendix). Items included four domains or developmental areas; physical, cognitive, communication and social development. It is based on a likert scale. Items are scored with numbers 0-5. Number 0 represents no progress, and the number 5 represents maximal progress or the attainment of the milestone. This assessment tool can be administered by parents, teachers, community workers, rural health workers, social workers, psychologists, rehabilitation therapists, pediatrics, rural health physicians, nurses and professionals in any setting. Scores are assigned on the basis of a parent's/caregivers responses and direct observation of professional's, who is delivering early intervention to the child or assessing the child to start intervention. Direct observation by professionals is not the criteria of assigning the scores on EIT, but this consultative process of assigning scores helps both parties (parent and therapist) to understand scoring patterns and stay on same level of understating during the intervention process. This tool measures development between ages 3 months to 3 years. However it can be administered from age of 3 months to 6 years. It can also be administered in order to design and monitor interventions with older age groups of children with confirmed diagnosis of moderate or lower level intellectual disabilities. The diagnosis result is valid for one year. It is designed to be administered every quarter (3 months) and/or for four times in a year to monitor the developmental progress.

Limitations

The EIT tool primarily belongs to the discipline of developmental and health psychology. The EIT tool can provide an indication of deficit in development in quantifiable terms, but the results cannot be matched with other standard psychological tests such as the DST and VSMS in terms of the

diagnostic criteria of DD.

Conclusion

The EIT tool helps users to measure progress in four domains of development in quantifiable terms. This tool can be easily used by variety of professionals and parents due to its simple language and easy scoring. Compared to other existing tools, EIT takes far less time in administration. It is a parent/caregivers and professional friendly assessment tool.

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Appendix

Early Intervention Tool (EIT), India
(Age: 3 months to 3 Years)

Child Name: DOB/Age:
Parent name: Date:
Referred by: Address:

Items	Date (1- 3 months)	Date (3-6 months)	Date (6-9 months)	Date (9-12 months)
	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
1. Make eye contact	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐
2. Neck control present	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐
3. Roll over	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐
4. Sit with support	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐
5. Sit independently	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐
6. Stand with support	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐
7. Stand independently	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐
8. Walk with supports	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐
9. Walks independently	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐
10. Babbling	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐
11. Tries to talk	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐
12. Says one word	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐
13. Says two words	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐
14. Have toilet control	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐
Total				

The full questionnaire is downloadable here