

Measurement Issues: Measures of Infant Mental Health

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Dr. Eduardo Szaniecki MD, PgDip., MRCPsych., MPhil

Consultant Child and Adolescent Psychiatrist

Hertfordshire Partnership NHS Foundation Trust

Peace Children Centre, Peace Prospect, Watford, Hertfordshire WD17 3EW

Email for correspondence: eduardoszaniecki@doctors.org.uk

Professor Jacqueline Barnes, BSc, MSc, PhD

Birkbeck, University of London

Summary

Background: Emotional and behavioural problems emerging in very young children can represent a challenge to the child and family and warrant early identification and appropriate support or intervention. Diagnostic systems are being developed that allow for specific difficulties to be identified and this review summarises them. The review describes the psychometric properties and potential for use in clinical practice of a range of instruments and methods that are available to identify infant mental health difficulties, and which may be suitable for use in primary care settings, including observations, questionnaires and checklists.

Conclusions: While debate continues about whether infant mental health problems can or should be identified, the use of standardised tools may help clinicians to compare observations of infants so that those emerging as atypical can receive additional attention, reflecting a more targeted approach to primary care services (DH 2009; DH 2010).

Keywords: infancy, measurement, mental health, assessment.

Key practitioner messages:

- Infant mental health is a complex developmental area and attempts to create classification or diagnostic systems are still ongoing and subject to debate. However, they can provide a useful framework for clinicians.
- There have been challenges to the identification of early-onset mental health problems related to stigma and the possibility that problems may be transient.
- Infant emotional and behavioural difficulties are strongly related to the environment and in particular to parental behaviour and the dynamics intrinsic to infant-parent relationships.
- A range of assessment methods is available including structured and semi-structured interviews, questionnaires, checklists, and methods that look at the nature of parent–infant relationships.
- Many of the most robust methods, such as observational strategies, require extensive training to administer and code and are more applicable for research than routine practice.
- Structured checklists such as the ASQ-SE and the BITSEA are among those with good potential for use in primary care practice.

1. Introduction

Background

Emotional and behavioural problems emerging in very young children can represent a challenge to the child and family and warrant early identification and appropriate support or intervention (Costello, Egger, & Angold, 2005). Several factors have contributed to interest in the identification of emotional and behavioural problems in infants. First, there have been advances in understanding developmental models that highlight the need to integrate knowledge about infant functioning and psychopathology in the various contexts within which the child is developing (Bronfenbrenner, 1989; Greenspan & Wieder, 2001; Zeanah, Boris, & Scheeringa, 1997). Second, contrary to the notion that problems in very young children are transient, a number of studies have highlighted that they may be precursors to mental health difficulties in later stages of infancy and beyond (Mathiesen & Sanson, 2000; Skovgaard et al., 2008). Third, empirical studies have shown that the prevalence of mental health problems in two to five year-olds (Egger et al., 2006) and school-age children is high (Ford, Goodman, & Meltzer, 2003), which suggests that it is important to be aware of problems prior to those ages to offer early intervention. Finally, a number of studies have emphasised the complexity of identifiable psychopathology in infancy (Burnham, Goodlin-Jones, Gaylor, & Anders, 2002; Chatoor, 2002) but prevalence rates have been similar to those for older children, ranging from 6% - 12% (Briggs-Gowan, Carter, Moye Skuban, & McCue Horwitz, 2001; Costello, Egger, & Angold, 2005; Lavigne et al., 1996).

Despite this increasing interest in and concern about infant psychopathology, it is debated whether infants' emotional and behavioural problems can and/or should be identified (Zeanah & Zeanah, 2009). The nature, form, and function of infant behaviour and its interpretation are influenced by factors such as developmental level, age, cultural

and family differences, expectations, and parental attributions. It has been argued that this period of development involves such rapid shifts that reliable identification or measurement of symptoms is difficult, if not impossible (Carter, Briggs-Gowan, & Davis, 2004). Also, and perhaps the most crucial factor and one that differentiates the identification and measurement of infant mental health problems from that of older children, is the utmost relational dependence infants have to their caregivers and to the dynamics intrinsic to infant-parent relationships (Roseblum, Dayton & Muzik, 2009).

Conceptualisation of infant mental health developmental problems

Measurement methods need to be based on a conceptual model of disorder but mental health difficulties appearing during infancy are notoriously difficult to conceptualise. First, it is challenging to define and delineate the boundaries between what could be thought as typical as opposed to atypical for infants given the substantial normal variability in developmental trajectories. However, some indicators can be useful in differentiating between transient problems and more entrenched ones that might need intervention (Belden, Thomson & Luby, 2008), particularly the nature and level of distress or maladaptive behaviour and whether/how it interferes with development and functioning (Zeanah & Zeanah, 2009b). Second, some symptoms may be a developmental adjustment to environmental stressors or psychosocial adversities, although others may persist and be an indication of problematic development (Greenspan & Wieder, 1997). Third, there may be no specific risk factor(s) associated with a disorder but a multitude of factors, often relating to one another, including genetic influences (Plomin & Rutter, 1998). For instance, difficulties in this young age group are known to be more often influenced by problematic familial and environmental relationships, such as marital discord, than by factors intrinsic to the child (Angold & Egger, 2004; Carter, Briggs-Gowan, & Davis, 2004; Skovgaard et al., 2007). Fourth, reliance on third parties (parents, teachers, others) to report behaviours can be subjected

to a variety of reporting biases (Briggs-Gowan, Carter, & Schwab-Stone, 1996). While this is true for preschool children the lack of capacity to communicate verbally in infancy makes it more questionable to rely totally on third party reports. Last, it has been the subject of debate as to whether or not infants are developmentally able to suffer from mental health disorders. The argument against is based partly on the idea that it is a challenge to establish when (and whether) a child has the developmental ability for symptoms that derive from more developed cognitive capacities (Task Force, 2003).

Classification of infant mental health disorders

Measurement leading to specific diagnoses is generally embedded within a clinical classification system. While all the issues pertaining to conceptualisation are naturally ongoing, there has been progress in classification systems of early childhood disorders which has contributed to the refinement of diagnoses applicable to very young children. They include the Research Diagnostic Criteria for Infants and Preschool Children (RDC) (Taskforce, 2003), the Diagnostic Classification 0-3: Diagnostic classification of mental health and developmental disorders in infancy and early childhood – DC: 0-3 (Zero to Three, 1994) and its revised version, DC: 0-3R (2005), and the Diagnostic and Statistical Manual for Primary Care (DSM-PC) (Wolraich et al., 1997). The DSM and ICD systems are criticised for the lack of appropriate diagnostic criteria for common infants and toddler mental health problems (Del Carmen-Wiggins & Carter, 2001; Zeanah, Boris, & Scheeringa, 1997) and the lack of time frames specific to the age group 0-3 (Postert et al., 2009). Their use in this age group can ultimately be unhelpful as most health professionals end up applying diagnostic categories geared towards older children (for example, mood disorders) extending then downward toward infancy (Greenspan & Wieder, 2001). Also, there have been limited studies looking at the psychometric evidence to support the use of measures based on diagnostic classification

systems (Bagner et al., 2012). However, the RDC, DC:0-3, and DSM-PC are useful and important systems that have not only influenced each other but can also serve as a framework to clinical and empirical practice. As such, mental health difficulties in infancy have been divided to reflect developmental constructs and models involving a range of domains: social interaction and attachment, regulation of physical functions (particularly sleep and feeding), and emotional states or affective expression (Skovgaard et al., 2008). Although there are few core symptoms that cluster into disorders specific to infants and although overlapping of problems in this age group is the rule (Angold & Egger, 2004), clinical experience has shown that certain infant emotional and behavioural problems do show a recurring pattern that can be identified and classified. Examples include: attachment disorders (Sroufe et al., 2005), anxieties (Scheeringa & Zeanah, 2008), depression / affective disorders (Skovgaard et al., 2007; Luby et al., 2003), crying, sleeping, feeding difficulties and their links with regulatory disorders (von Kries, Kalies, & Papousek, 2006; Johnson & Appleyard, 2010), disruptive and aggressive behaviours (Maughan & Rutter, 2008), and autism (Carr & Lord, 2009; Zwaigenbaum et al., 2005).

2. Approaches to infant mental health measurement and application in practice

Methods that cover the period from birth to two years of age are reviewed and some other relevant methods that extend to slightly older age are also included. Instruments that potentially could be used by practitioners are organised according to methodology, first, structured and unstructured observational methods then structured questionnaires, checklists and screening tools. Their psychometric properties are described where available and the feasibility of their use for clinical practice. Given its relevance to infant development, tools that look at the nature of parent-infant interaction and its links with infant mental health are covered in supplementary online materials together with

details of other neuro-developmental assessment instruments that include emotional and behavioural aspects of infant development.

Observational measures

Observational assessments provide descriptive, qualitative data, and can be broadly divided into naturalistic, semi-structured, and structured (Clark, 1985) - all of which are important means of gathering clinical and research information. Naturalistic home infant observation may provide a unique source of information and insight into infant's behaviour, state of mind, development, and about the nature of the relationship with caregivers and other family members (Miller et al., 1989; Reid, 1997) but they can be time and resource consuming. Semi-structured observational formats, usually play-based in clinical settings, can be useful to understand and assess the complexity of infant emotional and behavioural developmental attributes within the context of the child-parent relationship and dynamics (Barrows, 1997; Pollock & Horrocks, 2009) but the observed behaviour may not be representative of the particular behaviour in other environments, which emphasises the importance of follow-on observations or the use of questionnaires to supplement observations. The Functional Emotional Assessment Scale (FEAS) (DeGangi & Greenspan, 2001) is a semi-structured observational coding method to assess infants from 7 to 48 months and their caregivers, with six different checklists to cover different age ranges (for instance, 7-9, 10 to 12 months, and so on). It covers problems of attachment, interaction, communication, and self-regulation. A large, representative sample was used to validate the tool (N=468) (Greenspan & DeGangi, 2001) with inclusion criteria that allowed for infants with developmental problems as well as infants without such difficulties. Adequate psychometric properties were found in terms of discriminant validity (sensitivity 75-82%; specificity 49-74%), inter-rater reliability (range .83 to .98) in a small sample of 46 children (Bagner et al., 2012). However, while such semi-structured formats can lead to quantifiable and

reliable information, they are nevertheless usually lengthy and require extensive training before they can be used. The FEAS authors also emphasise that, for diagnostic purposes, it should be used in conjunction with other methods such as a clinical interview, parent questionnaires or formal testing (DeGangi & Greenspan, 2001).

A number of structured observational methods have been developed for research studies to identify risk and protective factors pertinent to young children's mental health and subsequent socio-emotional development (Clarke, Tluczek & Gallagher, 2004).

However, their incorporation into routine clinical practice has met with constraints such as the need for equipment (e.g., for video or digital media) and extensive time to training to code and then to code interactions (Benham, 2000). The Strange Situation Procedure (SSP) (Ainsworth et al., 1978) which assesses infant-caregiver attachment, for example, requires a specially equipped laboratory with cameras and observation windows (Miron, Lewis & Zeanah, 2009). Other more potentially usable structured or semi-structured observational tools have also been designed. The Parent-Child Early Relational Assessment, PCE-RA (Clark, 1985; 1999), evaluates the quality of caregiver-infant (0-60 months) interaction, with a particular emphasis on the behavioural and affective aspects of the relationship (Miron et al., 2009). Observations take place during four videotaped 5-minute situations that vary according to infant's age (involving feeding, free play, structured task, and separation-reunion), a technique that brings the method close to day-to-day activities. Ratings are made on seven-point Likert scales for caregiver, infant, and dyadic functioning domains. High inter-rater reliability (85%) and adequate internal consistency (alphas ranging from .78 to .91) have been reported (Clark, 1999; Clark et al., 2004) and convergent validity has been shown with the 'Parenting Stress Index', a measure of parent-child dyadic functioning (Bagner et al., 2012). It has been used in conjunction with video feedback to examine parental

perceptions of their parenting skills and of their infants and discriminates high-risk from normative dyads (Clark, et al., 2004). However, “the formal scoring system is complex and time consuming” (Miron et al., 2009, pg. 260) requiring a 4-day training, which limits its clinical use.

The Care-Index (Crittenden, 2003) focuses on maternal sensitivity in context of relationships with infants of 0-15 months. While promoted as a strategy to identify maladaptive parenting it also includes scales describing infant behaviours. A three to five minute video is made of parent and child playing and seven scales are scored, three about the mother/caregiver (sensitivity, control, responsiveness) and four about the infant (cooperativeness, compulsivity, difficultness, passivity). Each can range from 0 to 14 with a score of 5-6 indicating some concern and 4 or lower the need for intervention. The Care-index has been used in many studies (for example, Pajulo et al., 2012) and good inter-rater reliability was reported in a study that included mothers with post-natal depression (Sidor et al., 2011). However, use of the Care-Index as a screening tool is known to over-identify risk (Sidor et al., 2011) and it is not practical for community use due to its nature, cost to administer and to train coders.

Structured instruments (questionnaires, checklists, screening tools)

Structured instruments to assess infant mental health development have predominantly been designed to investigate normative and delayed social and emotional development and to screen for possible disorders that may need further input (Berger et al., 2010). It is not uncommon for structured instruments to be used in practice because they are easy to administer, have been used before (Carter et al., 2009), and can be a useful adjunct to clinical observations. Reliability is invariably lower than for those designed for older children due to rapid developmental shifts (Gilliam & Mayes, 2004). There is more

often evidence of content or face validity in such tools. Until recently, there had been a lack of valid and reliable, low-cost, user-friendly, and age-appropriate instruments to assess infants who might be at risk of developing emotional and behavioural difficulties but a small number are now available. Table I contains a summary of the properties of the most promising structured questionnaires designed to assess socio emotional difficulties in infants.

The Child Behaviour Checklists, originating in the USA, have been at the forefront of questionnaires designed to assess and identify children's behavioural and emotional problems with a version for infants as young as 18 months, the Child Behaviour Checklist for children 1½ to 5 years of age - (Achenbach & Rescorla, 2000). The instrument can be answered by a parent or used as an interview tool, and there is a teacher version, more relevant for preschool age children than infants. It contains 99 items that are rated as "not true", "sometimes true" or "often true" and takes about 10 to 20 minutes to complete. It provides useful measures of both "adaptive functioning and impairment" (Huffman & Nichols, 2004, pg. 474) and can be used to guide clinical interviews. The strengths are its psychometric properties and that it has been translated into a large number of different languages. The CBCL / 1.5-5 was normed on a large (N=700) sample of 18- to 71-month-old children (Achenbach & Rescorla, 2001). An eight-day test-retest reliability yielded correlations between .68 and .92 in a different non-referred smaller sample (N=68) and there has been support for convergent validity (Bagner et al., 2012) with measures such as the Infant Toddler Social-Emotional Assessment (ITSEA) (Carter et al., 2003). Scores above the cut-points have been found to be six times more likely for clinically referred infants (Carter et al., 2004). However, it is time-consuming to complete, costly and requires extra professional resources to administer and interpret. It is also not applicable for children younger than 18 months

and it does not include items covering domains such as infant's regulatory capacities and difficulties.

The Infant-Toddler Symptom Checklist - ITSC (De Gangi et al., 1995) is a 58-item, screening diagnostic tool for infants between 7 and 30 months that can be completed by a parent or professional. It covers potential symptoms of regulatory, attentional, and sensory problems but also some aspects of emotional and behavioural functioning. The ITSC has five versions for different age groups and takes about 10 minutes to complete. It has cut off scores to determine which children are considered at risk of developing a particular problem. The tool has acceptable validity (Skovgaard et al., 2007) and good predictive value with 78% of children identified early using the ITSC clinically diagnosed at 3 years of age using other validated measures such as the CBCL\ 2-3. (De Gangi et al., 2000). However, there are some inconsistencies; for instance, not all domains are assessed in every age range and the number of descriptors used to identify problem behaviour "varies between age ranges" (Berger et al., 2010, pg. 247), which makes it difficult to compare an infant's score across ages. Details of the normative sample are not clear and no reliability studies have yet taken place. Caution should be exercised when infants change age ranges but it can be considered a useful tool to identify infants in need of early intervention services.

The Toddler Behavioural Screening Inventory - TBSI (Mouton-Simien, McCain, & Kelley, 1997) was developed in the USA to give primary child health care professionals a screening questionnaire that could be used in baby clinics. It has 40 items covering two dimensions (frequency of problems and problem perception) and assesses infant behaviour within the previous month. Frequency of problems is rated on a three point scale (0, 1, 2) giving a range from 0-80; perception of problematic behaviour is rated as present/not present and can range from 0-40; cut off points of 35 on the frequency scale and 10 on the problem scale are recommended. In a study of 581 mothers of 1 to 3 year

olds (Mouton-Simien et al., 1997) internal validity was found to be good (Cronbach's alphas: frequency .88; problems .90). Subsequent validation with another US sample (N=362, infants / toddlers 12-41 months) that correspond closely with the type of population presenting to most UK primary care settings had comparable conclusions (McCain, Kelley, & Fishbein, 1999). The two scales showed good internal consistency (both .90), there was good test-retest reliability after a 2-week interval (frequency scale $r=.89$ and problem scale $r=.68$). Concurrent validity was evaluated against the CBCL \ 2-3 (Achenbach, Edelbrock, & Howell, 1987) and a relatively strong correlation was obtained ($r=.70$) for the frequency scale but less so with the problem scale, suggesting that the "two scales should be used together" (Huffman & Nichols, 2004). The majority (82%) of participants were correctly classified when the two scales were used. The TBSI is brief and easy to score but it does not address both problems and competencies. Furthermore, the TBSI is not applicable to children under 12 months. It is a promising tool but is has been little used in prevalence and longitudinal studies (Skovgaard et al., 2007).

The Infant-Toddler Social and Emotional Assessment - ITSEA (Carter et al., 2003) and the Brief Infant-Toddler Social-Emotional Assessment - BITSEA (Briggs-Gowan et al., 2004) are two related, well-validated and psychometrically sound tools (Briggs-Gowan & Carter, 2007; Carter et al., 2003; Carter et al., 1999; Huffman & Nichols, 2004) to assess socio-emotional-behavioural problems, delays, and competence in infants between 12-36 months. They include symptoms as outlined in the DC:0-3 (Zero to Three, 2005). The ITSEA items cover internalising and externalising behaviours and provide profiles of an infant's strengths and weaknesses in regulatory behaviours. Also, unlike its predecessors, the ITSEA covers competence (e.g., emotional awareness) as well as indices of clinically significant maladaptive behaviour (e.g. head banging), aiming at reducing response set biases (Huffman & Nichols, 2004). The questionnaire,

however, is long (139 items) so it may not be practical for use by busy clinicians such as primary health or community workers.

The 42 BITSEA items were taken from the ITSEA questions, selected according to clinical importance, professional judgement and empirical considerations (factor-loading analysis – Huffman & Nichols, 2004). It includes two scales (problems 31 items, competence 11 items) with items rated as “rarely”, “sometimes”, or “often”. The BITSEA can be completed by the parent or in an interview with a professional; administration and scoring may take around 15 minutes. The validation sample size was large (N=1,605), representative and included children from 12 to 36 months (Briggs-Gowan et al., 2004). It was validated through good criterion-related validity with the CBCL/1.5-5, good discriminant validity with a vocabulary checklist identifying language delay (Fenson et al., 1993), and good construct validity (Carter, 2002). It has strong test-retest reliability between 10-45 days (.85 and .87 for the problem and competence scales, respectively) (Bagner et al., 2012). The one-year stability is also acceptable with correlations of .53-.65 for the problem and competence scales, respectively (Bagner et al., 2012, p.117).

There is empirical support for the BITSEA as a valid and reliable brief screener of socio-emotional difficulties and delays in competence (Kruizinga et al., 2011).

However, this is especially for children over 24 months (Briggs-Gowan & Carter, 2008; Karabekiroglu et al., 2009). The questionnaire is short and may be useful in community practice and it has the advantage that it does not require training either to use or score it. Children scoring higher than the 25th centile on the problem scale and lower than the 15th centile on competence scale are deemed at risk (Berger et al., 2010). However, it does not cover children younger than 12 months .

The Ages and Stages Questionnaires-Social-Emotional version - ASQ-SE (Squires, Bricker, & Twombly, 2002) is a promising screening measure of socio-emotional-

behavioural competencies and problems designed for a wider age range, from birth to 66 months. It covers self-regulation, compliance, and affect, among other domains. The instrument has 22-36 items (depending on age), rated as “yes”, “sometimes” or “not yet”, and takes about 10-15 minutes for the parent to complete. Each age-band has been independently validated on a large, representative US population (N=3,014), although some ethnic groups were underrepresented e.g., African-American. The measure has good test-retest reliability (.94) for 1-3 week intervals, inter-rater reliability (.95), concurrent validity (.81-.95) and sensitivity (.75-.89) in detecting children with developmental delay and social-emotional problems that needed a referral (Bagner et al., 2012). It also has good specificity (.82-.96) and internal consistency (.67-.91) (Squires, Bricker, & Twombly, 2002). However, because the various scales differ in number of items and cut off scores, in follow up studies where the child may move age bands score systems need to be carefully interpreted to assess changes across such age-bands (Pollock & Horrocks, 2009). Nevertheless, it is relatively simple to score, it has been felt as containing appropriate questions and to be easy to understand by parents (Squires et al., 2001). It also yields cut-off scores indicating possible problems and identifying children who meet criteria to specialist services, and it includes social competencies. It is in routine use in the UK by family nurses delivering the Family Nurse Partnership programme (Barnes et al., 2011).

Lastly, the Brigance Infant and Toddler Screen II- BITS (Brigance & Glascoe, 2002) is a downward version of the Brigance Inventory of Early Development - BIED (Brigance, 1991) for children between 2 and 8 years of age. The BITS has infant (0-11 months) and toddler (12-23 months) versions, each containing 81-85 items and both are relatively quick to administer and complete (around 20 minutes). Items were selected from the BIED by a multidisciplinary team with expertise in child development to cover a range of developmental domains and skills relevant to younger children and including socio-

emotional items. The BITS was validated with 408 children aged 0-24 months representative of the US population. Parents completed a parent-report version and examiners completed and scored the direct elicitation/observation version. The BITS has excellent internal consistency (0.94 - 0.97), test-retest and inter-rater reliability (0.98 - 0.99) for both infant and toddler versions (Glascoe, 2002). Sensitivity and specificity (for a wider age range 0-90 months) was also good (.70-.82) (Berger et al., 2010). The instrument contains versions for direct professional observation and a parent interview/self-report version or it can be used in combination.

3. Summary and Conclusions

The foundation pillars within which infant mental health exist present significant challenges to classification systems, assessment and measurement, and there is not as yet consensus about how best to operationalise and define most emotional and behavioural problems in very young children or indeed if they should be defined and identified. This is partly explained by the fact that infant mental development encompasses a wide range of complex and interrelated domains (Egger & Emde, 2011), making the boundaries between types of emotions and behaviours not as sharply demarcated as for older children. Also, infant mental health symptoms are “unstable and transient.....and [it is] often not possible to identify discrete diagnostic categories for disorders” (Angold & Egger, 2004, pg.125). Regulatory Disorders is one example of an infant mental health problem, which, although it shows face validity and a clinical symptomatic pattern (De Gangi et al., 2000), still lacks systematic empirical validity and evidence and at this point in time it meets with no similar categories in ICD or DSM.

The identification of infant mental health problems is closely associated with having appropriate methods and techniques that cover the nature and level of difficulties presented by very young children. Over the last few years several methods have been developed to assess their emotional, social, and behavioural problems and competences through observations, questionnaires, interviews, or checklists. Nevertheless, it is important to place all methods of infant mental health assessment in context and be realistic (and cautious) about their roles and results. The setting and circumstances of the assessment may significantly impact on outcomes (more so than with older children). The use of measurements poses some challenges too, as infants show very rapid and multimodal developmental shifts in several areas and limitations in one developmental area may significantly affect assessment in a different domain. Instruments may also show great variation in

psychometric properties and rigour. Which tool to use in practice would depend on several factors, such as cost, time taken to undertake it (by the practitioner and parent), parental literacy, staffing constraints, the not uncommon need to be trained so that it can be applied reliably, and ease of scoring and interpreting (Carter et al., 2009). Several of the instruments reviewed were developed for research, have predominantly been applied to research settings rather than in routine practice, need extensive and costly training to use it, and some are not available for use in the community at large. Tools for clinical settings need to be brief and easy to use, to administer, score, and interpret. They should also have good reliability and validity, have been developed with a wide range of different types of families, from a mix of social class backgrounds and ethnic groups. Such instruments should be reasonably sensitive, able to identify a minimum percentage (for example, at least 70%) of children with problems but with good specificity so that they only mis-identify a small proportion without problems. They should also provide clinically useful information (Carter, 2002). Some of the instruments available for assessing emotional and/or behavioural problems in infants are brief and/or easy to fill in or score (Squires et al., 2002) and available for community use (Brigance & Glascoe, 2002). Furthermore, there are some screening instruments that not only cover relevant infant clinical and developmental areas but also have excellent psychometric properties (for example, ITSC, BITS, BITSEA, ASQ-SE, and TBSI). Both the ASQ-SE and BITSEA in particular are sufficiently sensitive to detect social-emotional/behavioural problems in community samples (Carter et al., 2004) and have been designed to be completed by a range of individuals, including primary care health workers and caregivers.

The low use of infant classification systems in UK CAMH practice may have been affected by the fact that the systems advocate categorization of disorders rather than individuals (Liebman, Barnard & Wieder, 2004). The diagnostic labels may also be perceived by UK CAMH professionals as culturally inappropriate since many originate in the USA where service users and

professionals need the diagnosis to justify provision of and payment for services (Achenbach & Rescorla, 2004). In addition, training for clinicians with statutory access to infants, such as health visitors and other primary health care workers, does not generally focus on diagnostic frameworks shaped by a medical model derived from adult mental health criteria. However, classification and identification of infant mental health problems, and sensitively probing about emotional difficulties very early on may help implementation of interventions whilst assessing parental willingness to engage with such a process. A substantial number of interventions relevant to infant mental health are available (Barnes, 2003). Appropriate interventions, such as Video Interaction Guidance (Svanberg, Mennet, & Spieker, 2010), parenting programmes (Hiscock et al., 2008), and home-based interventions (Olds, Sadler, & Kitzman, 2007) could be directed to families with infants whose behaviour is challenging, those with a difficult temperament or those who cry excessively and/or are difficult to soothe (Douglas & Hill, 2011).

In summary, developmentally sensitive diagnostic criteria for mental health disorders in early childhood are being advanced (for a review, see Egger & Emde, 2011) and literature is emerging concerning classification systems and definitions of some infant mental health disorders (Skovgaard, 2010). Different ways of using structured methods in assessing infants with a range of emotional and behavioural difficulties have been described (Pettit, 2008) and empirical studies have focused on or have used such tools (Glascoe & Leew, 2010; Skovgaard et al., 2004). The use of standardised tools can help clinicians to compare observations of infants so that those emerging as atypical can receive additional attention and, with changes in primary care services including a more targeted approach (DH 2009; DH 2010), the use of more structured assessments may well be a feature in the future.

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	CBCL 1.5-5	ITSC	TBSI	BITSEA	ASQ-SE	BITS
Age range	18 - 60 months	7 – 30 months	12 - 36 months	12 - 36 months	3 - 60 months	0 – 11 and 12 – 23 months
Type of instrument	Checklist/questionnaire	Interview/checklist	Screening	Screening	Screening	Screening
Reporter	Caregiver	Caregiver report or interview with scoring and interpretation done by highly trained staff	Caregiver	Caregivers can complete independently. Professional completes scoring.	Caregivers can complete and partially score. Professionals complete scoring	Parent-interview / self-report version, direct professional elicitation / observation, or a combination of both.
Number of items	99	58	40	42	19 - 35 per age interval	81 - 85
Administration time	15 - 20 minutes	10 - 20 minutes	Not reported	10 - 15 minutes	10 - 15 minutes	20 minutes
Domains	Externalising; internalising; total problem; DSM oriented scales	Emotional – behavioural problems Regulatory disorders	Problem behaviours Regulatory Frequency of problems Maternal perception	Problem scale: activity/impulsivity, aggression/defiance, depression/withdrawal, anxiety, sleep, eating, toileting problems. Competence scale: attention, imitation, play, empathy, social relatedness.	Social-emotional and behavioural problems; social competencies, self-regulation	Several developmental domains and skills, including socio-emotional items, self help, and language.
How items are scored	3-point rating scale	3-point rating scale	3 point rating scale	3 point rating scale	3 point rating scale	Up to 15 skills are scored per specific developmental area.
Scoring / cut-points to identify children with problems	Cut-points are available	Cut off points are available	Cut points are available. Follow-up of any behaviour reported as problematic is suggested	Problem and competence index totals as well as cut-points based on child age and sex	Cut off points are available. High score suggests need for further evaluation	Cutoff scores are calculated for all age levels, indicating potential giftedness and/or psychosocial risk.
Normative sample	Scales based on rating of 1,728 children and normed on an independent sample of 700 children.	Based on 221 children the majority of which were white middle class.	312 mothers of infants and toddlers rated the initial 93-item TBSI followed by a new sample of 581 mothers that rated the later 40-item version	1280 parent/child dyads from community: 66% white, 33.8% minority 237 parent/child dyads from early intervention programs.	3041 59% white 41% minority	408 children aged 0 - 24 months, representative of the US population.

Inter-rater reliability	None described	None described	Not described	Problem scale ICC=.82 Competence scale ICC=.72 (ICC - intraclass correlation coefficient)	.67-.91	0.99
Test-retest reliability	Not described	Not described	.89 (frequency scale); .68 (problem scale)	ICC = 0.85 -0.87	n=344 94% agreement	0.98
Internal consistency (Cronbach's alpha)	Not described	Not described	.88 (frequency scale) and .90 (problem scale)	Problem scale .83-.89 Competence scale .66-.75	.67-.91 (overall .82)	0.94 – 0.97
Content Validity	None described	Not described	181 mothers with 12-41 month old children were given a questionnaire which had been generated and reviewed by professionals who worked with young children, to list problem behaviours commonly experienced; additional items added through literature review and available relevant rating scales.	60 items from ITSEA chosen by expert panel	Expert panel	Items were selected from the Brigance Inventory of Early Development (itself standardized on 1156 children)
Concurrent validity	Not described	Bayley scales and other tests of sensory functioning and attention: correlations were statistically significant	With CBCL/2-3: .70 (frequency scale) and .54 (problem scale).	With ITSEA: Problem scale: .36-.79 across both samples. Competence scale .83-.89	Overall .89 (.81-.95)	0.46 – 0.91

Strengths / weaknesses	Covers a large profile of behaviours, including language development.	Comes with 6 separate versions for different age groups for both diagnostic and screening purposes. The normative sample encompassed chiefly white middle class children.	Developmentally appropriate; does not address competencies	Brief Excellent Methodology Sensitive to ASD	Further validity studies needed	Brief, flexible, it produces a wide range of scores. Time needed to familiarize with instruction manual / video, data charts, and technical reports. Need also a box of materials.
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