

Bayley Scales Of Infant and Toddler Development

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Last Update: November 21, 2022.

Definition/Introduction

Bayley Scales of Infant and Toddler Development is an extensive formal developmental assessment tool for diagnosing developmental delays in early childhood. BSID is the commonly used abbreviation for Bayley Scales of Infant and Toddler Development. BSID scores are from a norm-referenced assessment of early childhood development. Nancy Bayley published the first BSID in 1969. The current BSID in use is BSID 4, published in 2019. BSID 4 is time-saving, has greater clinical sensitivity and accuracy when compared to BSD 3. It takes about 30 to 70 minutes to complete the test.

Infant and Childhood Development

Infant and childhood development comprises physical, cognitive, social-emotional, linguistic, and behavioral milestones. The differences in cultural, environmental, and genetic factors influence development. The development process is rapid and cumulative. Developmental disabilities are common and are reported 1 in 6 children in the United States. The number of children with select developmental disabilities (autism, attention deficit hyperactivity disorder, and other developmental delays) has increased, requiring more health and education services.[1]

Developmental Assessments

An estimated 5 to 10% of the pediatric population has a developmental disability.[2] There are three different strategies to detect developmental delay.

1. Routine developmental surveillance is where the health care professional takes a short developmental history and does a brief examination to elicit any developmental delay. Identification of developmental delay will be ineffective when based solely on routine surveillance.[2]
2. A developmental screening tool is a systematic and structured tool to identify developmental delay. Although screening tools are cost and time-efficient, they are not diagnostic and have less utility in high-risk populations. [3]
3. Formal developmental tests are widely accepted and have a diagnostic utility.

Formal Developmental Assessment Tools

The purpose of assessment and the age groups decides the type of tool used for formal development assessment. The evaluation will vary depending on the clinician's skill, the family's needs, and concerns. Some of them are norm-referenced, and some are criterion-referenced.

- A norm-referenced test is a standardized process of evaluating an individual against the performance of their peers.[4]

- A criterion-referenced test evaluates the development of a child against pre-specified criteria. It helps to measure whole-group performance like in school.

Following is the list of developmental assessment tools commonly used in practice.

1. Norm-referenced
2.
 - BSID-4 - Bayley Scales of Infant Development-4
 - Battelle Developmental Inventory 3rd edition
 - DAYC-2: Developmental Assessment of Young Children-2
3. Criterion-referenced
4.
 - AEPS - Assessment Evaluation & Programming System
 - ELAP - Early Learning Accomplishment Profile
 - IDA-2: Infant Toddler Developmental Assessment -2
5. Brigance (IED) Inventory of Early Development III (both)

The Bayley Scales of Infant and Toddler Development

The Bayley Scales is in practice for several decades as a useful tool for detecting early developmental delay in clinical and research settings.[5] In 1969, Nancy Bayley published the first BSID. The first BSID assessed motor and mental domains in the age group from 3 to 28 months. BSID 2nd edition published in 1993 added behavior rating scale and widened the age group from 1 to 42 months. BSID -III published in 2006 assessed development from 1 to 42 months in 5 domains - cognition, motor, language, socio-emotional, and adaptive behavior. BSID 4 was published in 2019 and is in current use. BSID 4 retained the five domains from BSID III.

Difference between BSID III versus BSID 4

1. Scoring is Dichotomous (1, 0) in BSID III, whereas scoring is polytomous (2,1,0) in BSID4.
2. When compared to BSID III, BSID 4 takes approximately 30% less time to complete the assessment.
3. BSID 4 has questions for the caregiver.
4. Scoring is software-based in BSID III. BSID 4 scores need web-based administration.
5. BSID 4 has retained the same five domains as in BSIDIII. However, in BSID4, the number of items in each section is decreased.
 1. BSID III has the following number of items in each domain
 - Cognitive scale - 91 items
 - Language scale - 49 items in the receptive and 48 items in the expressive domain
 - Motor scale - 66 items in the fine motor and 72 items in the gross motor domain
 - Social-Emotional Scale derived from Greenspan Chart.
 - Adaptive behavior scale derived from ABAS (Adaptive behavior assessment system)
 2. BSID4 has the following number of items
 - Cognitive scale - 81 items

- Language scale - 42 items in the receptive and 37 items in the expressive domain
- Motor scale - 46 items in the fine motor and 58 items in the gross motor domain
- Social-Emotional Scale is unmodified from Bayley III.
- The adaptive behavior scale utilizes the Vineland behavior assessment system.

Purpose

The BSID is employed to determine children's developmental functioning and plan management for kids with developmental delays. BSID helps in the following ways.

1. Early identification of intellectual delay. Re-assessments can help to monitor progress over time.
2. To individualize the management and to accommodate a child's developmental and learning needs.
3. To assess individual domains of development: for example, cognitive delay.
4. To help researchers as a research tool.

Early diagnosis of developmental disability is a critical responsibility of pediatric professionals.[6] BSID helps in detecting developmental delay early and also in initiating early developmental intervention.

Target Age Group

BSID III and BSID -4 are used for the age group starting from 16 days to 42 months.

BSID Kit

Each BSID kit will have a manual, forms, a booklet for the motor response, questionnaires for Social-Emotional, Adaptive Behavior domain, caregiver reports, observation Checklist, and manipulative set. Cognitive, Language, and Motor scores assessment needs a web-based device. The questionnaire for caregivers includes socio-emotional and adaptive domains. Scores are given as polytomous, ranging from 0 to 2. In BSID-4 scoring, two is Mastery, one is emerging, and zero means not present. After the assessment, the assessor summarizes standard and scaled scores. BSID administration requires training, which happens through webinars and workshops.

Preparation

The examiner explains to the caretaker what will happen during the assessment. By doing this helps in establishing a rapport with the child and avoid parental concerns during the evaluation. The caretaker is advised not to talk or aid the kid during the assessment, thereby avoiding skewed deviation.

Issues of Concern

Limitations and Precautions

BSID scores represent mostly the U.S. population. BSID assessment scores are impacted profoundly by testing conditions such as environmental, psychological, and physical. The development process is rapid so that a single assessment score will give only a snapshot of the current functioning level. BSID assessment is time-consuming and needs appropriate training. Knowing the strength and limitations will help to make diagnostic interpretations.

Prematurity and BSID

Preterm infants (born before 37 weeks gestation) are at risk for developmental delay.[7] Bayley scale can be used for preterm kids. However, age adjustment is made up to 2 years while administering BSID for preterm kids. Compared

to previous editions of the BSID, the Bayley-III has excellent predictive validity for IQ assessment by WPPSI-III at age four years in preterm children (Bode et al.).[8]

Risks

There are no risks associated with administering BSID.

Clinical Significance

Developmental disabilities are common and are reported 1 in 6 children in the United States. Bayley Scales of Infant and Toddler Development is the most frequently used tests in infant developmental assessment.[9] The Bayley Scales helps in detecting developmental delay early and also in initiating early developmental intervention. BSID III and BSID 4 are used for the age group starting from 16 days to 42 months. The cognitive and language scales of the Bayley are a handy instrument for early diagnosis of Language disability.[10]

Nursing, Allied Health, and Interprofessional Team Interventions

Psychologists, neuropsychologists, or developmental pediatricians are the ones who commonly administer the Bayley scale. Occupational therapists, speech and language pathologists, and pediatric nurse practitioners also can utilize Bayley III and Bayley 4 in their practice. After appropriate training, anyone with proper qualifications can master Bayley. Bayley scales has excellent applicability for transdisciplinary or interdisciplinary teams as it can effectively identify children who need early intervention.[11]

Review Questions

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