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Research Article

Assessment Batteries Used in Pediatric Rehabilitation

Fuat Sonmez[1], Deniz Cakir[2], Emre Demir[3] and Nilay Comuk Balci[2]*

[1]Professor, Dr. Ilhan Ozdemir Training and Research Hospital, Giresun, Turkey

[2]Department of Physiotherapy and Rehabilitation, Ondokuz Mayis University, Faculty of Health Sciences, Samsun, Turkey

[3]Giresun Physical Medicine and Rehabilitation Center, Giresun, Turkey

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***Corresponding author:** Nilay Comuk Balci, Department of Physiotherapy and Rehabilitation, Ondokuz Mayis University, Faculty of Health Sciences, Samsun, Turkey, E-mail: nlycmk@yahoo.com

ORCiD: https://orcid.org/0000-0002-3617-6345

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Abstract

Background: Classifying tools used for the pediatric population can expedite the creation of preventive, diagnostic, and therapeutic strategies, helping to identify factors influencing this group and enhancing their development.

Objectives: This study aims to present the assessment batteries used in the pediatric population together so that assessors and practitioners can easily examine the batteries and decide which test battery to use.

Method: Seventy questionnaire scales used in pediatric rehabilitation were compiled from the electronic database.

Results: There are many batteries used in the pediatric population. Categorizing these batteries provides significant advantages and convenience for readers.

Conclusion: In pediatric rehabilitation, various assessment batteries are used to assess the abilities and development of children, and these tools vary according to age groups. Different tools have been determined in areas such as motor, sensory, neuromuscular, cognitive, and family assessments, and each significantly impacts children's development. By defining reliable assessment methods for each area, it is aimed to develop early intervention and appropriate treatment strategies.

Introduction

Children develop at different rates, and it is important to distinguish those within the "normal" range from those following a pathological course [1]. There is good evidence that early identification and early intervention improve the outcomes of children with developmental impairments [2,3]. During fetal life and the first two years postnatally, the brain shows strong developmental activity. High developmental activity implies high neuroplasticity, suggesting that especially the first year offers great opportunities for early intervention to improve the child's developmental outcome [4]. Given the importance of the early years, early intervention is crucial. Because learning is cumulative, barriers to healthy development early in life impede development at each subsequent stage [5]. Interventions can include physiotherapy, occupational therapy, psychology, neurodevelopmental treatment, parent-infant relationship enhancement, infant stimulation, infant development, developmental care, and education [6]. These interventions aim to prevent or minimize motor, cognitive, and emotional disorders in young children who are disadvantaged due to biological or environmental risk factors. In this context, the environment, social relationships, and parents have an important role in early intervention [6]. Namely, interventions that are tailored to the family, the child, and their interaction, may be successful [4].

Illnesses, injuries, and different disease processes can have a profound impact on the attainment of developmental milestones, with delays noted in gross motor, fine motor,

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speech and language, and/or psychosocial areas [7]. Genetic factors may also determine the fundamental developmental potential, but environmental factors also have crucial influences on the profile achieved. Positive experiences during early childhood may enhance brain development, particularly in the area of linguistic and social skills [1]. Environmental factors are a fundamental determinant of early child development and, in turn, early child development is a determinant of health, well-being, and learning skills across the balance of the life course [8]. Environmental factors play a critical role in the early phases of conception, pregnancy, and post-natal periods of child development. Sensitive periods in brain and biological development start prenatally and continue throughout childhood and adolescence. The extent to which these processes lead to healthy development depends upon the qualities of stimulation, support, and nurturance in the social environments in which children live, learn, and grow [9].

Considering that very rapid progress is seen in all developmental areas in early childhood, it is very important to support, evaluate, and monitor each developmental area correctly during this period. These developmental areas are; cognitive, language, social-emotional, motor, and self-care, which is not a developmental area but includes skills that are important for the child in this period. Since all these developmental areas should be developed in a balanced way, one developmental area should not be held back from the other and each should be supported equally [10].

A thorough understanding of the developmental milestones and the age at which the child attained them can assist with diagnosis and treatment protocols. Many tools can be used to evaluate and quantify functional status, developmental skills, cognition and potential for academic achievement, visual motor abilities, a child's social and adaptive skills, and perceived quality of life, disability, and perception, in the pediatric population [7]. Measurement tools are standardized instruments evaluated for their psychometric properties and used to measure the change in a person's health status through quantitative assessment of function [11]. These tools are effective for use in the clinical setting because standardized outcome measures provide a common language among physical therapists [12]. The choice of an assessment tool is determined by the purpose of assessing [13].

During pediatric rehabilitation practices, children's competencies in different areas and their abilities should be assessed at different times to create a program and determine its effectiveness [14]. There is a wide variety of tools available in the field of pediatric rehabilitation to help determine appropriate treatment and its effectiveness and to identify the child's strengths and weaknesses in all areas [7,15]. For these assessments to be standardized and meaningful, different researchers have developed various assessment tools, and both the reliability and validity of these tools have been investigated and translated into different languages [14].

This study aims to investigate the effectiveness and standardization of assessment tools used in different areas of pediatric rehabilitation practice by examining the current evidence that early intervention improves the outcomes of children with developmental disorders and emphasizing the importance of accurate assessment and support of children's developmental processes in the early period.

Method

We have searched in the PubMed, MEDLINE (Ovid), EMBASE (Ovid), Cochrane, CINAHL (EBSCO), WILEY, Web of Science, PEDro, and Scopus databases with the keywords of:

1. Motor Assessment Batteries in Childhood
2. Sensory Assessment Batteries in Childhood
3. Cognitive Assessment Batteries in Childhood
4. Family Assessment Batteries in Childhood
5. Life Quality Assessment Batteries in Childhood
6. Visual Assessment Batteries in Childhood
7. Neuro-muscular Assessment Batteries in Childhood
8. Brachial Pleksus (BP) Assessment Batteries in Childhood
9. Neuro-motor Assessment Batteries in Childhood
10. Multi-Dimensional Assessment Batteries in Childhood

A comprehensive search of the database was conducted in August 2024, for studies concerning the Assessment Batteries in childhood by using the following steps (Figure 1), Table 1:

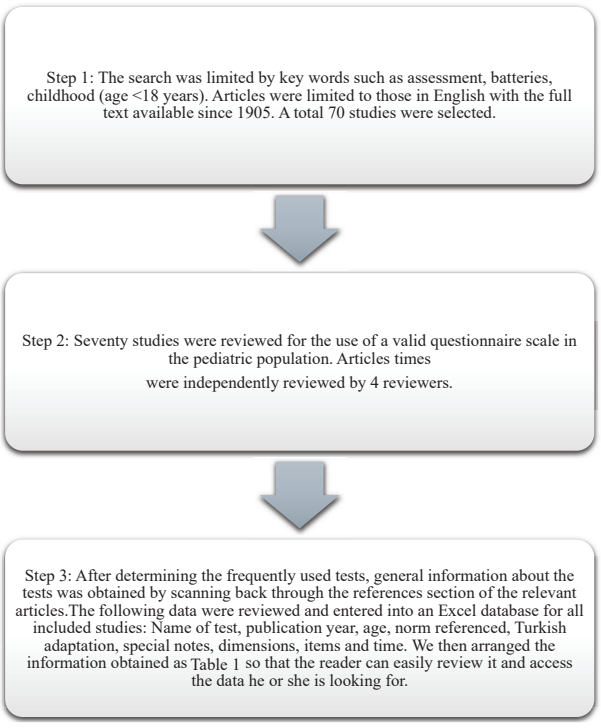

Figure 1: Flow diagram of this research.

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Table 1: Assessment tools used in pediatric rehabilitation.

Childhood Assessment Batteries								
Name of test	**Publication year**	**Age**	**Norm-Referenced**	**Turkish Adaptation**	**Special Notes**	**Dimensions**	**Items**	**Time**
Motor Assessment Batteries								
Test Of Infant Motor Profile (TIMP)	1995	34 Week- 4 Months	Yes	Yes	Although the practitioner course is recommended, it can also be applied by purchasing the manual and sheets.	1. Head orientation in the midline 2. Ballistic movements of the limb. 3. Antigravity control 4. Postural, auditory, and visual response to stimuli	42	25-45 min.
Movement Assessment of Infants (MAI)	1980	0-12 Months	Yes	No		1. Muscle tone 2. Primitive reflexes 3. Automatic reactions 4. Voluntary movements	65	30 min.
Harris Infant Neuromotor Test (HINT)	1996	3-12 Months	Yes	No	It has open-ended questions.	1. Background information on the child and Caregiver 2. Parent/Primary Caregiver 3.Assessing neuromotor milestones 4.Active and passive muscle tone 5. Head circumference 6. Stereotypical movement patterns 7. Behavioral interactions	27	45-60 min.
Alberta Infant Motor Scale (AİMS)	1992	0-18 Months	Yes	Yes		In pronation, supination, sitting, and standing positions 1. Weight-bearing 2. Posture 3. Antigravity movement	58	10-20 min.
ovement Assessment of Children (MAC)	2016	0-24 Months	Yes	No		1. General Observations 2. Special Senses 3. Head Control 4. Upper Extremities Hands 5. Pelvis and Lower Extremities 6. Primitive Reflexes/Reactions 7. Muscle Tone	52	30 min.
Infant Motor Profile (IMP)	2008	3-18 Months	Yes	Yes	Completion of the practitioner course is required.	1. Variability – size of repertoire 2. Variability – ability to select 3. Symmetry 4. Fluency 5. Performance	80	15 min.
Milani-Comporetti Developmental Examination	1985	0-24 Months	No	No		1. Evoked responses 2. Primitive reflexes	27	4-8 min.
Bruininks-Oseretsky Motor Proficiency Test	1978	4.5-14.5 Years	Yes	Yes		1. Running speed and agility 2. Balance 3. Bi-directional coordination 4. Resistancev 5. Arm-hand coordination 6. Reaction speed 7. Visual-motor control 8. Arm speed and dexterity	46	45-60 min.
Test of Gross Motor Development-3 (TGMD-3)	2000 (2016)	3-10 Years	No	No		1. Gross Motor 2. Fine Motor (subtests: locomotor and object control)	50	1 15-20 min.
Movement Assessment Battery for Children (Movement ABC-2)	2007	3-16 Years	Yes	No		1. Manual dexterity 2. Balls skills (catching and throwing) 3. Balance	30	20-40 min.
Sensory Assessment Batteries								
Nottingham Sensory Assessment	1998	-	Yes	No		1. Tactile Sensation 2. Two-point Discrimination 3. Stereognosis	3	1 10-15 min.

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Sensory Integration and Praxis Test (SIPT)	1989	4 - 8 Years - 11 Month	Yes	No	Completion of the practitioner course is required.	1. Space Visualization 2. Figure – Ground Perception 3. Standing and Walking Balance 4. Design Copying 5. Postural Praxis 6. Bilateral Motor Coordination 7. Praxis on Verbal Command 8. Constractional Praxis 9. Postrotary Nystagmus 10. Motor Accuracy 11. Sequencing Praxis 12. Oral Praxis 13. Manual Form Perception 14. Kinesthesia 15. Finger Identification 16. Graphesthesia 17. Localisation of Tactile Stimuli	17	2 hours
The Test of Sensory Function in Infants	1989	4-18 Months	Yes	No		1. Reactivity to Tactile Deep Pressure 2. Visual Tactile Integration 3. Adaptive Motor Function 4. Ocular Motor Control 5. Reactivity to Vestibular Stimulation	24	20 min.
The Sensory Rating Scale	2009	0-3 Years	Yes	No		1. Touch 2. Movement and gravity 3. Hearing 4. Vision 5. Taste and smell 6. Temperament and sensitivity		
Sensory Processing Measure Pre-School	2010	2-5 Years	Yes	Yes		1. Vision 2. Hearing 3.Touch 4. Body Awareness 5. Balance and Motion 6. Total Sensory System 7. Planning and Ideas 8. and Social Participation	150	15-20 min.
Sensory Processing Measure	1993	5-12 Years	No	Yes		1. Vision 2. Hearing 3.Touch 4. Body Awareness 5. Balance and Motion 6. Total Sensory System 7. Planning and Ideas 8. and Social Participation	147-152	15-20 min.
Cognitive Assessment Batteries								
Stanford-Binet Test	1905	2-16 Years	Yes	Yes	It is the first intelligence test developed.	1. Verbal Judgment, 2. Abstract/Visual Judgment, 3. Quantitative Judgment, 4. Short-Term Memory	30	1 hour
Anatolian-Sak Intelligence Scale: The First Turkish Intelligence Test	2023	2-14 Years	Yes	Yes	It was developed specifically for the Turkish community.	1. Verbal analogical reasoning 2. Vocabulary 3. Visual-spatial analogical reasoning 4. Visual perceptual flexibility 5. Verbal short-term memory 6. Visual sequential processing memory 7. Visual pattern memory.	256	25-45 min.

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Wechsler Intelligence Scale for Children (WISC-R)	1949	6-17 Years	Yes	Yes	Completion of the practitioner course is required.	1. General Information 2. Similarities 3. Arithmetic 4. Reasoning 5. Vocabulary 6. Number Sequence 7. Picture Completion 8. Picture Arrangement 9. Pattern with Cubes 10. Piece Assembly 11. Code 12. Maze		1-1.5 hours
Cattell Intelligence Test	1957	6-14 Years	Yes	Yes		1. Intelligence 2. Performance	46	25 min.
Porteus Maze Test	1959	7-14 Years	Yes	Yes		In the test application, the patient is expected to reach the exit point of the maze by following the rules such as not entering dead ends and not crossing the lines drawn with a pencil.	12	15-30 min.
Children's Perception Test (CAT)	1949	3-10 Years	Yes	Yes		The child is asked to interpret each figure and his/her interpretation is evaluated.	10	20-45 min.
Cognitive Assessment System(CAS)	1979	5-17 Years	Yes	Yes		1. Planning 2. Attention 3. Simultaneous 4. Successive		40 min.-1 hour
Leather Test	1929 (2013)	2-18 Years	Yes	Yes		1. Fluid intelligence 2. Visualization 3. Memory 4. Attention	10	90 min.
Moxo Test	1947	6-12 Years	Yes	Yes	It has special distractors. Completion of the practitioner course is required.	1. Attention 2. Timing 3. Impulsivity 4. Hyperactivity	8	15-20 min.
Behavior Rating Inventory of Executive Function (BRIEF)	2000	5-18 Years	Yes	Yes		1. Behavioral regulation scales 2. Metacognition scales	86	10-20 min.
Family Assessment Batteries								
McMaster Family Assessment Scale	1983		Yes	Yes		1. Problem solving 2. Communication 3. Cylinder 4. Emotional response 5. Showing the necessary attention 6. Behavior control 7. General activities	60	20 min.
The Perceived Family Functioning Scale (PFFS)	2011		Yes	Yes	It was developed specifically for the Turkish community.	1. Family communication and positive emotions, 2. Conflicts negative emotions 3. Rules 4. Boundaries	32	
Family Participation Scale	1993		Yes	Yes		1. Parenting 2. Communication 3. Volunteering 4. Learning at home 5. Decision making 6. Collaborating with the community	152	
The Family Adaptability and Cohesion Evaluation Scale (FACES IV)	1982		Yes	Yes		1. Family cohesion 2. Family flexibility 3. Family communication scale 4. Family satisfaction scale	62	
Caregiver Difficulties Scale (CDS)	2013		Yes	Yes		1. Support for caregiving 2. Impact on self 3. Social and economic strain 3. Concerns for the child	25	40-45 min.

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Family Strengths Inventory	1982		Yes	No		1. Pride 2. Accord	12	
Quality of Life Assessment Batteries								
The Assessment of Life Habits (LIFE-H)	1998	0-4 Years, 5-13 Years, General	Yes	Yes		1. Nutrition 2. Fitness 3. Personal care 4. Communication 5. Housing 6. Mobility 7. Responsibilities 8. İnterpersonal relationships 9. Community Life 10. Education 11. Employment 12. Recreation	55-77	20-60 min.
Pediatric Evaluation of Disability Inventory (PEDI)	2010	6 Months 7.5 Years	Yes	Yes		1. Self-care 2. Mobility 3. Social function	197	45-60 min.
Pediatric Outcome Data Collection Instrument (PODCI)	2008		Yes	Yes		1. Upper Extremity and Physical Function 2. Transfers, Basic Mobility 3. Sports, Physical Functioning 4. Happiness 5. Pain, Comfort 6. Satisfaction 7. Expectations	83-86	20 min.
Pediatric Quality of Life Inventory		2-4 Years, 5-7 Years, 8-12 Years, 13-18 Years	Yes	Yes		1. Physical functioning 2. Emotional functioning 3. Social functioning 4. School functioning	23	<4 min.
Child Health Questionnaire (CHQ) (CHQ- CF87) (CHQ-PF50) (CHQ-PF28)	1996	5-18 Years	Yes	Yes		1. Physical functioning 2. General health 3. Bodily pain 4. Behavior 5. Mental health 6. Role-emotional 7. Self-esteem 8. Parent impact-time 9. Parent impact-emotional 10. Role/social–physical scale	87 (child form) 50 (parent form) 28 (parent form)	16-25 min. 10-15 min. 5-10 min.
Visual Assessment Batteries								
Motor-Free Visual Perception Test-3	1972	4-95 Years	Yes	Yes		1. Visual discrimination 2. Visual figure-Ground 3. Visual memory 4. Visual closure 5. Visual-spatial	65	25 min.
Central Visual Impeirment (CVI) Questionniare	2011		Yes	No		1. Visual attitude 2. Ventral stream 3. Dorsal stream 4. Complex problems 5. Other senses	47	<10 min.
Visual Skills İnventory	2007	4-8 Years, 9-12 Years	Yes	No			51 54	15-20 min.
Frostig Developmental Visual Perception Test	1963	4-8 Years	Yes	No		1. Eye-motor coordination 2. Perception of figure-ground 3. Perception of form constancy 4. Perception of position in space 5. Perception of spatial relationships	63	30-60 min.
Neuro-muscular Assessment Batteries								
Hammersmith Motor Ability Score						1. Functional motor abilities	33	30-60 min.
The North Star Ambulatory Assessment	2011		Yes	No		1. Functional motor abilities	17	5-30 min.
Brooke Upper Extremity Functional Rating Scale	1992					1. Functional motor abilities	6	

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Vignos Functional Rating Scale	1993					1. Functional motor abilities	10	
The Motor Function Measure (MFM)	2000 (2005)		Yes	Yes		1. Standing and transfers 2. Axial and proximal mobility 3. Distal motor ability	20 32	30-50 min.
The Egen Klassifikation (EK) Scale	2002 (2008)			Yes		1. Functional motor abilities	17	20-30 min.
The quick motor function test (QMFT)	2012			Yes		1. Functional motor abilities	16	20-30 min.
The Children's Hospital of Philadelphia Infant Test of Neuromuscular Disorders (CHOP INTEND)	2010	0-2 Years				1. Functional motor abilities	16	20-30 min.
Upper Limb Short Questionnaire	2020			Yes		1. Upper limb function 2. Pain\ 3. Stiffness	14	15-20 min.
Brachial Pleksus (BP) Assessment Batteries								
Narakas	1989	0-3 Weeks				Group 1: C5-6, Group 2: C5-6-7, Group 3: C5-6-7-8 T1, Group 4: Horner's Syndrome		
Quality of Upper Extremity Skills Test (QUEST)	1983	18 Months - 8 Years				1. Dissociated movements 2. Grasp 3. Protective extension 4. Weight-bearing	36	30-45 min.
Melbourne Assessment 2 (MA-2)	1999	2.5-15 Years				1. Range of movement 2. Accuracy of reach and placement 3. Dexterity of grasp, release, and manipulation 4. Fluency of movement	14	20-30 min.
The Active Movement Scale (AMS)	2002	1 Months -15 Years				1. Gravity minimized 2. Against Gravity	15	20-30 min.
Functional Dexterity Test (FDT)	2003					1. Non-injured hand 2. İnjured hand		
ABILHAND-Kids	2004	6-15 Years				1. Daily life activities	21	<5 min.
Disability of the Arm, Shoulder and Hand (DASH)	2008	8-18 Years				1. Daily life activities 2. Symptoms	30	<5 min.
Assisting Hand Assessment (AHA)	2007	18 Months-12 Years					22	15 min.
The Children's Hand Use Experience	2011	6-18 Years					29	15-30 min.
Brachial Pleksus Outcome Measure	2012	4-19 Years		Yes		1. Shoulder 2. Elbow and forearm 3. Wrist, finger and thumb	14	10 min.
Pediatric Motor Activity Log-Revised (PMAL-R)	2012	2-17 Years		Yes		1. How often 2. How well	22	<5 min.
Multi-Dimensional Assessment Batteries								
Bayley III	1969	1-42 months	Yes	Yes	Completion of the practitioner course is required.	1. Adaptive behavior 2. Cognitive 3. Language 4. Motor 5. Social-emotional		30-90 min.
Denver II	1967	0-6 years	Yes	Yes	Completion of the practitioner course is required.	1. Personal-social 2. Fine motor-adaptive 3. Language 4. Gross motor	125	15 min.

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The Neurological, Sensory, Motor, Developmental Assessment (NSMDA)	1978	1 Months-6 Years	Yes			1. Neurological 2. Postural 3. Sensory 4. Fine 5. Gross motor		20-45 min.
Developmental Assessment of Yang Child (DAYC)	2012	0-5 Years	Yes			1. Cognition 2. Communication 3. Social-emotional development 4. Physical development 5. Adaptive behavior.		50-80 min.
Neuro-motor Assessment Batteries								
General Movement Assessment (GMA)	1961	<20 Weeks	Yes		Completion of the practitioner course is required. It offers the highest predictive power of cerebral palsy when combined with HINE and magnetic resonance imaging.			5 min.
Hammersmith Infant Neurological Examination (HINE)	1981	2-24 Months	Yes	Yes	It offers the highest predictive power of cerebral palsy when combined with GMA and magnetic resonance imaging.	1. Cranial nerves 2. Posture 3. Movements 4. Tone 5. Reflexes	26	20-30 min.
Hammersmith Neonatal Neurological Examination (HNNE)	1981	Term corrected age	Yes	Yes		1. Tone 2. Motor patterns 3. Observation of spontaneous movements 4. Reflexes 5. Visual and auditory attention 6. Behaviour	34	20-30 min.
Standardized Infant Neuro-developmental assessment (SINDA)	2019	6 Weeks-12 Months	Yes	Yes	Completion of the practitioner course is required.	1. Neurological 2. Developmental 3. Socio-emotional	119	<10 min.
the Neonatal Infant Motor Assessment Scale (NIMAS)	2024	26-44 postconceptional weeks				1.Sociodemograpic Form 2. Automatic Motor Area 3. Functional Motor Area	36	20-25 min.

Results

Characteristics of the included studies

The characteristics of the included studies were assessed in several dimensions: Name of the test, publication year, age, norm-referenced, Turkish adaptation, special notes, dimensions, items, and time.

Batteries used to assess the pediatric population

To evaluate batteries used in the pediatric population, 70 different tools were identified and divided into 10 categories: Motor Assessment Batteries, Sensory Assessment Batteries, Cognitive Assessment Batteries, Family Assessment Batteries, Quality of Life Assessment Batteries, Visual Assessment Batteries, Neuro-muscular Assessment Batteries, Brachial Plexus (BP) Assessment Batteries, Multi-Dimensinal Assessment Batteries, Neuro-motor Assessment Batteries.

Physiotherapists use motor assessment batteries in pediatric rehabilitation to determine children's motor abilities and disabilities with motor development [16]. Motor development is a result of changes in time [17] so we need different assessment tools for the ages. For this purpose, we determined motor assessment tools for different age groups. Some of the assessment batteries are focused on very specific time window such as Test of Infant Motor Profile (TIMP) [18], Harris Infant Neuromotor Test (HINT) [19], Alberta Infant Motor Scale (AIMS) [20], Movement Assessment of Infants (MAI) [21], Infant Motor Profile (IMP) [22], Movement Assessment of Children (MAC) [23], Milani-Comporetti Developmental Examination [24] and some tools have wider time Windows such as Bruininks-Oseretsky Test of Motor Proficiency, Second Edition (BOT-2) [25] and Movement Assessment Battery for Children (Movement ABC-2) [26].

We perceive our environment with our senses, and children's perception of the environment is different from adults due to their developmental stage [27]. Assessing the senses of children we identified six different assessment tools. The Nottingham Sensory Assessment tool doesn't have any age limitation because it assesses senses in general [28]. Some tools assess more specific senses for age groups such as the Sensory Integration and Praxis Test (SIPT) [29], The Test of Sensory Function in Infants [30], The Sensory Rating Scale [31], Sensory Processing Measure, Sensory Processing Measure Pre-School [32].

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Cognitive assessment is used mainly when a child shows clues of developmental delay or suspects of delay. Although there are norm-referenced cognitive assessment tools some scholars raised concerns about tools adequacies [33]. Therefore we tried to determine tools with different abilities. There are well-established and almost traditional tools like The Stanford-Binet Intelligence Scale [34], Wechsler Intelligence Scale for Children (WISC-R) [35], Cattell Intelligence Test [36], Cognitive Assessment System(CAS) [37], Children's Apperception Test (CAT) [38], Leiter international performance scale-revised (Leiter-R) [39], some newer tools that developed more recently and less time consuming like Behavior Rating Inventory of Executive Function (BRIEF) [40] some developed specifically a culture's people like Anatolian-Sak Intelligence Scale: The First Turkish Intelligence Test [41] and some of the tools are technologically enhanced like MOXO d-CPT [42].

Family is our first social environment and has a great impact on children's development [43] so we need to evaluate family as well. For this purpose we identified The McMaster family assessment device [44], Family Participation Scale [45], The Family Adaptability and Cohesion Evaluation Scale (FACES IV) [46], Caregiver Difficulties Scale (CDS) [47], Family Strengths Inventory [48] as internationally used and cross-referenced tools and "The Perceived Family Functioning Scale (PFFS)," a tool that specifically developed for Turkish culture [49].

Various assessment batteries are used for the classification and evaluation of brachial plexus injuries [50]. Narakas is the method used for motor and sensory classification in the brachial plexus [51]. Batteries such as Quality of Upper Extremity Skills Test (QUEST) [52], Melbourne Assessment 2 (MA-2) [53], The Active Movement Scale (AMS) [54], Functional Dexterity Test (FDT) [55], Assisting Hand Assessment (AHA) [56], The Children Hand Use Experience (CHEQ) [57], Brachial Pleksus Outcome Measure (BPOM) [58], Pediatric Motor Activity Log-Revised (PMAL-R) [59] are used to evaluate the quality of movement and motor skills. ABILHAND-Kids [60] and Disability of the Arm, Shoulder, and Hand (DASH) [61] evaluate daily life activities.

World Health Organization (WHO) defines health as a state of complete physical, mental, and social well-being, not the absence of disease or infirmity, in 1948 [62]. And quality of life assessment batteries have become more important in general health assessment. The Assessment of Life Habits (LIFE-H) [63], Pediatric Evaluation of Disability Inventory (PEDI) [64], Pediatric Outcome Data Collection Instrument (PODCI) [65], Pediatric Quality of Life Inventory [66], Child Health Questionnaire (CHQ) [67] are effective batteries that evaluate the quality of life in multiple aspects.

Visual skills directly affect motor and sensory functions at every stage of a person's life. For this reason, assessment of visual functions is one of the important points in developing motor and sensory skills. Batteries such as Motor-Free Visual Perception Test-3 [68], Central Visual Impairment (CVI) Questionnaire [69], Visual Skills İnventory [70] and Frostig Developmental Test of Visual Perception [71] can evaluate visual skills precisely and effectively.

Neuromuscular disorders are a diverse group of problems that affect how muscles and neurons work. Motor neurons, nerves, neuromuscular junctions, and muscles can be affected by these problems depending on the specific disorder. The results of these disorders can be very severe, even lethal. Thus proper evaluation and re-evaluation are crucial in this disorder [72]. We determined Hammersmith Motor Ability Score [73], The North Star Ambulatory Assessment [74], Brooke Upper Extremity Functional Rating Scale [75], Vignos Functional Rating Scale [76], The Motor Function Measure (MFM) [77], The Egen Klassifikation (EK) Scale [78], The quick motor function test (QMFT) [79], The Children's Hospital of Philadelphia Infant Test of Neuromuscular Disorders (CHOP INTEND) [80], Upper Limb Short Questionnaire [81] are reliable tools for evaluating children with neuromuscular disorders.

Hammersmith Neonatal Neurological Examination (HNNE) [82], and Standardized Infant NeuroDevelopmental Assessment (SINDA) [83] are some of the tools used for neuromotor assessment. General Movement Assessment (GMA) [84] and Hammersmith Infant Neurological Examination (HINE) [85] are the two neuromotor assessment tools that have great value for cerebral palsy risk detection [86]. With the support of magnetic resonance imaging, these two tools have the highest evidence rate for accurately determining children with cerebral palsy [87]. The Neonatal Infant Motor Assessment Scale (NIMAS) however is one of the most recent tools for neuromotor assessment [88].

There are some limitations in our study. The first of these is that our search was not systematic, and the other is that only some database (PubMed, MEDLINE (Ovid), EMBASE (Ovid), WILEY, Web of Science, PEDro, and Scopus) was scanned. In future studies, systematic research covering multiple databases would be beneficial.

Conclusion

The assessment of the pediatric population is of great importance. These assessments should take a holistic approach to the child. There are many assessment batteries used in pediatrics and many of the batteries used have been tested for reliability and validity with adequate features. Before deciding on a tool to be used, the content of the elements of the tool should be examined thoroughly. Categorizing these tools can accelerate the development of preventive, diagnostic, and therapeutic strategies to determine the factors affecting the pediatric population and to support and improve the development of this population in pediatric rehabilitation clinics.

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