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ORIGINAL RESEARCH

Systematization of evaluation instruments for the two first years of life of typical or risk infants according to the ICF model

Sistematização de instrumentos de avaliação para os dois primeiros anos de vida de bebês típicos ou em risco conforme o modelo da CIF

Sistematización de herramientas de evaluación para los primeros dos años de vida de bebés típicos o en riesgo según el modelo CIF

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ABSTRACT | The objective of this study was to identify low-cost instruments of evaluation of neuropsychomotor development (NPMD) of children aged zero to two years, that can be used in the context of daycare and/or clinical environment in early intervention programs, and to systematize these instruments as the biopsychosocial model of the International Classification of Functioning, Disability and Health (ICF). NPMD evaluation instruments with translation or adaptation for Brazil were selected. For this purpose, the ICF domains were chosen triangulating the ICF-CY's own checklist, the early stimulation core set, and the latest version of the ICF for searching the evaluation instruments in literature. Two physical therapists and a third for discordant items performed the systematization of the selected categories of ICF. The scales that met the criteria were: Alberta Infant Motor Scale (AIMS), Denver II Screening Test, Pedlatric Quality of Life Inventory (*PedSQl*™), Affordance in the Home Environment for Motor Development-Infant Scale (AHEMD-IS) and Mother-child bond. Even with these scales, there was a need for a complementary anamnesis questionnaire for the infant's caregiver, data from the Child Health Handbook and a socioeconomic questionnaire from the Brazilian Association of Research Companies for Brazil (ABEP). This systematization is available in the appendix and seeks to facilitate the broader view of the physical therapist or education professional with a biopsychosocial comprehension of the infants, in addition to allowing the early identification of risks and subsidizing actions of promotion and intervention in different contexts.

Keywords | International Classification of Functioning, Disability and Health; Child Development; Physical Therapy Specialty; Education.

RESUMO | O objetivo deste trabalho foi identificar instrumentos de avaliação do desenvolvimento neuropsicomotor (DNPM) de crianças de 0 a 2 anos, de baixo custo, que possam ser usados no contexto de creche e/ou ambiente clínico em programas de intervenção precoce, sistematizando esses instrumentos conforme o modelo biopsicossocial da Classificação Internacional de Funcionalidade, Incapacidade e Saúde (CIF). Foram selecionados instrumentos de avaliação do DNPM com tradução ou adaptação para o Brasil. Para isso os domínios da CIF foram escolhidos triangulando o *checklist* da própria CIF-CJ, *core set* de estimulação precoce e a última versão da CIF, para busca na literatura de instrumentos de avaliação. A sistematização das categorias selecionadas da CIF foi realizada por dois fisioterapeutas, e um terceiro para itens discordantes. As escalas que responderam aos critérios foram: *Alberta Infant Motor Scale* (AIMS), Teste de Triagem de Denver II, Inventário Pediátrico sobre Qualidade de Vida (PedSQl™), *Affordance in the Home Environment for Motor Development-Infant Scale* (AHEMD-IS) e vínculo mãe-bebê. Mesmo com essas escalas, verificou-se a

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necessidade de um questionário de anamnese complementar para o responsável, dados da Caderneta de Saúde da Criança e de um questionário socioeconômico da Associação Brasileira de Empresas de Pesquisa para o Brasil (ABEP). Essa sistematização está disponível no apêndice, e procura facilitar o olhar ampliado do fisioterapeuta ou profissional da educação com abrangência biopsicossocial dos bebês, além de possibilitar a identificação de riscos de forma precoce e subsidiar ações de promoção e intervenção em diferentes contextos.

Descritores | Classificação Internacional de Funcionalidade, Incapacidade e Saúde; Desenvolvimento Infantil; Fisioterapia; Educação.

RESUMEN | El objetivo de este estudio fue identificar herramientas de evaluación de desarrollo neuropsicomotor (DNPM) de bajo costo para niños de 0 a 2 años las cuales se pueden utilizar en el contexto de jardines infantiles y/o el entorno clínico en programas de intervención temprana, y sistematizar estos instrumentos como el modelo biopsicosocial de la Clasificación Internacional de Funcionamiento, Discapacidad y Salud (CIF). Se seleccionaron las herramientas de evaluación del DNPM con traducción o adaptación a Brasil. Para esto, los dominios de CIF se eligieron triangulando el *checklist* de la CIF-IA, *core set* de estimulación temprana y la última versión de CIF, para buscar en la literatura herramientas de evaluación. La sistematización de las categorías de CIF seleccionadas fue realizada por dos fisioterapeutas, y un tercero para artículos discordantes. Las escalas que cumplieron con los criterios fueron: *Alberta Infant Motor Scale* (AIMS), Prueba de tamizaje del desarrollo Denver II, *Pediatric Quality of Life Inventory* (*PedSQl™*), *Affordance in the Home Environment for Motor Development-Infant Scale* (AHEMD-IS) y el enlace madre e hijo. Incluso con estas escalas, era necesario un cuestionario de anamnesis complementario para el tutor, datos del Manual de Salud Infantil y un cuestionario socioeconómico de la Asociación Brasileña de Empresas de Investigación para Brasil (ABEP). Esta sistematización está disponible en el apéndice y busca facilitar la apariencia ampliada del fisioterapeuta o profesional de la educación con cobertura biopsicosocial de los bebés, así como permitir la identificación temprana de riesgos y subsidiar la promoción e intervención en diferentes contextos.

Palabras clave | Clasificación Internacional del Funcionamiento, de la Discapacidad y de la Salud; Desarrollo Infantil; Fisioterapia; Educación.

INTRODUCTION

The World Health Organization (WHO) suggests that health condition assessments consider, in addition to body structures and functions, the attention to environmental and personal influences – as well as activity and participation – classified in the domains of the International Classification of Functioning, Disability and Health (ICF)[1]. This broader view of health meets the current theories of child development, which currently follow the contextual/ecological theoretical model[2].

The effect of interventions must consider these domains[3] under conditions of stimulation of typical development and/or in the existence of neuromotor disorders, considering specific core sets for delays in development[4] and other Pediatric conditions[5].

Daycare centers, previously conceived from a welfarist and tutoring vision, now have an elementary educational role in the integral development of children[6], given that early childhood is a period of intense neuroplasticity, being crucial for future acquisitions[7]. In addition to family support by enabling the family to be inserted in the labor market, daycare centers have a role in educating children, who sometimes spend most of their time in these institutions[8].

However, there are few studies on typical development[2], especially in daycare centers. Currently, there is no scale or instrument that contemplates all ICF domains for detection and planning of monitoring and intervention programs in children, especially in the case of infants with risk and/or developmental delay – for whom early intervention programs are indicated.

Therefore, the use of low-cost succinct evaluation scales of development, elaborated for the child population, systematized according to the biopsychosocial model of the ICF and directed to the reality of the daycare environment, can facilitate the professional observation of the categories that require the most attention and subsidize early intervention actions.

Many instruments for assessing child development require training, time and have a high cost[9], impairing their use in clinical practice and research projects. Moreover, many instruments – when and if used individually – focus on motor, cognitive or language aspects, neglecting emotional and social ones[9], which are equally relevant for development.

Thus, the main objective of this study was to identify instruments for the evaluation of neuropsychomotor development (NPMD) of children aged 0 to 2, of low cost, that can be used in daycare contexts and/or clinical environment in intervention programs. The secondary objective was to systematize these instruments according to the ICF model and to associate the subcategories of the ICF with the items of the scales.

METHODOLOGY

This research is part of a larger Brazilian study with the public name "*Alegria em Movimento*".

The initial step was preparing the core set[1] for early intervention to thus systematize the search according to the most relevant domains in relation to child development[2]. The checklist of the International Classification of Functioning, Disability and Health for Children and Youth (ICF-CY)[10] and the ICF manual[11] were used to obtain specific descriptions according to the domains and categories related to child development and to ratify items. Following, validated and/or adapted instruments for the Brazilian population were searched considering the main investigated domains. For such, the following keywords were used – in Portuguese and English – in the SciELO and Medline/Pubmed databases, respectively: "*desenvolvimento infantil e escala e fisioterapia e típico*" and "infant development and scale and physical therapy and typical". Due to bringing insufficient results for the proposed objective, ICF was not searched. The search was conducted from April to June 2018 and no time period limit was established (Figure 1).

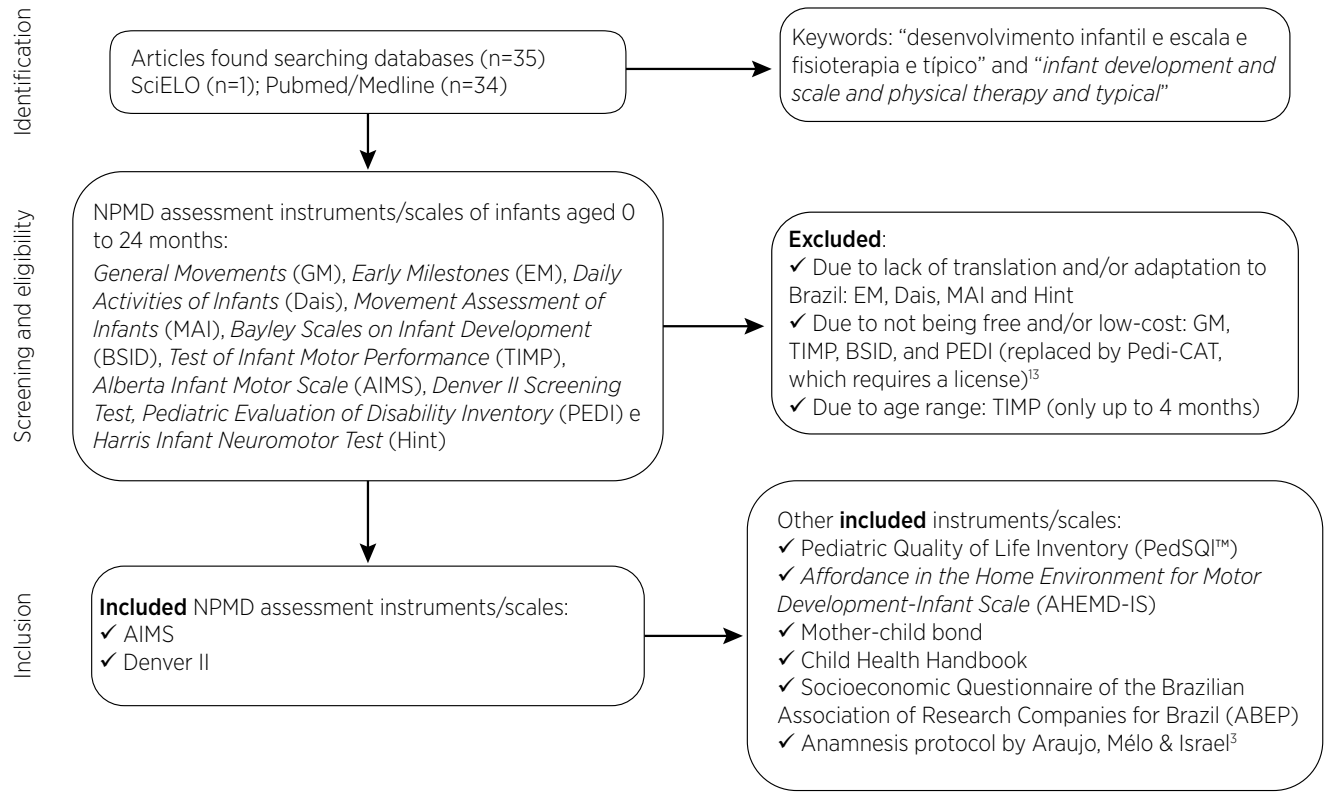

Figure 1. Flowchart of the search for evaluation instruments of infants in databases

The studies selected were those that used assessment scales of neuropsychomotor development for typical children or with risk of delayed NPMD, aged between 0 and 24 months. High-cost scales and scales that were used specifically on pathological conditions were excluded.

To answer the questions related to development and the early intervention program, the ICF categories were chosen relating the ones suggested in the core set of Pan et al.[4] for early stimulation, the ICF-CY checklist[10,12] and the latest version of ICF[11].

After selection, the scales were systematized according to the ICF classification system and divided according to functioning and disability – and its two components: body functions and structure and activities and participation –; and contextual factors such as environmental and personal.

The systematization of ICF was performed by two physical therapists with experience in the evaluation of NPMD and in ICF; they performed the association between the ICF and the items of the scales – independently – to ascertain possible redundancies and/or less relevant items. The opinion of a third physical therapist – who also had experience in the selected theme – was used for items in which an agreement was not reached between the researchers.

RESULTS

When searching the chosen keywords, 35 articles were found (one in SciELO and 34 in Pubmed) that cite the following instruments: General Movements (GM), Early Milestones (EM), Daily Activities of Infants (Dais), Movement Assessment of Infants (MAI), Bayley Scales on Infant Development (BSID), I (TIMP), Alberta Infant Motor Scale (AIMS), Denver II Screening Test, Pediatric Evaluation of Disability Inventory (PEDI) and Harris Infant Neuromotor Test (Hint).

Of these instruments and/or scales, the following were excluded due to not having a validated translation/adaptation for Brazil: EM, Dais, MAI and Hint; and due to not being free and/or low-cost: GM, TIMP, BSID and PEDI (which has a new version, PEDI-CAT, requiring a license for its use)[13]. TIMP was also excluded due to approaching infants only up to 4 months of age, which does not contemplate the scope of this study. Hint was also excluded because its validation is only for infants in the northeast region of Brazil.

The low-cost, rapid application validated and/or adapted scales for Brazil available in the literature for NPMD assessment were as follows: Alberta Infant Motor Scale (AIMS)[14] and Denver II Screening Test[15]. The Pediatric Quality of Life Inventory (PedSQl™)[16], Affordance in the Home Environment for Motor Development-Infant Scale (AHEMD-IS)[17] and Mother-child bond[18] were also selected. Even with these scales, the need for a complementary questionnaire for application with the parent/guardian was verified, so the anamnesis proposed by Araujo, Mélo & Israel[3], data from the Child Health Handbook and a questionnaire by Brazilian Association of Research Companies for Brazil (ABEP)[18] were selected, thus all items of the ICF were contemed, as shown in Figure 2.

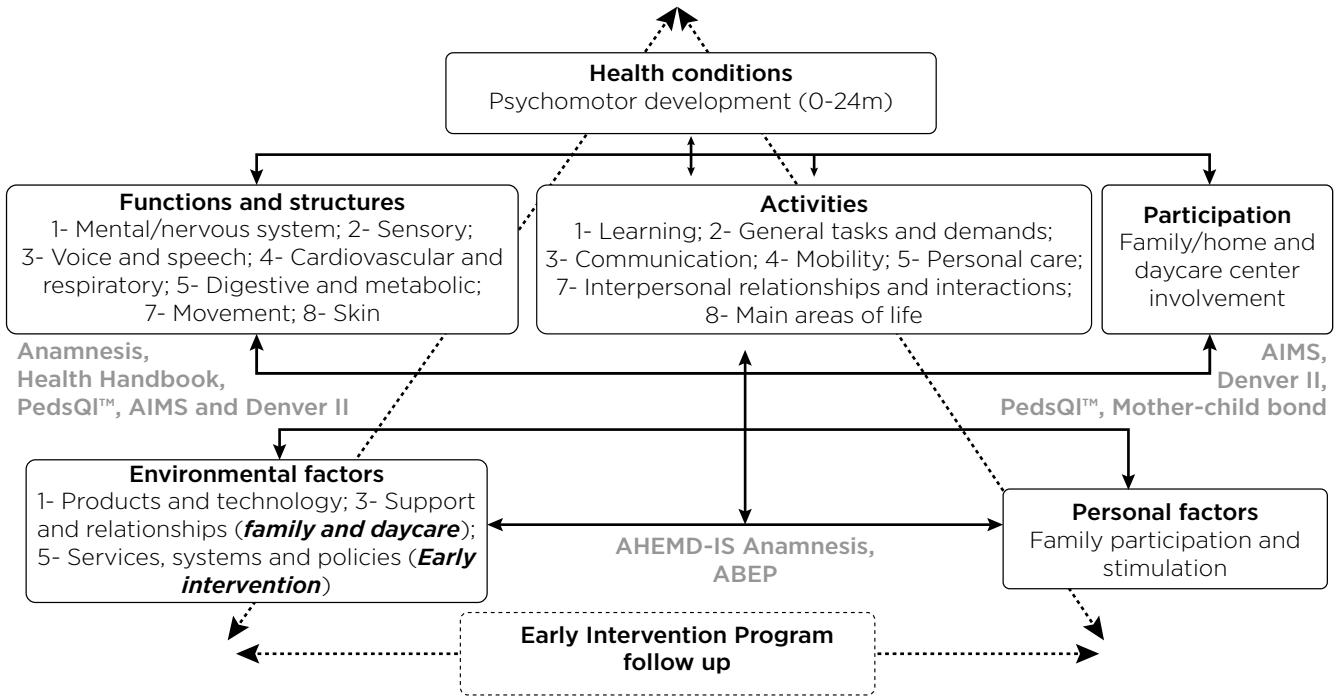

Figure 2. List of the evaluation instruments of infants selected by the ICF biopsychosocial model

Chart 1 presents a systematization of the chosen instruments with the ICF components considered as the most relevant for intervention programs in infants aged 0 to 2 years. The ICF facilitated the organization of assessments to contemplate all domains related to health and development conditions.

Chart 1. Infant assessment instruments according to the ICF domains and categories

ICF			
Component	Domains	Categories	Assessment instruments
Function	1-Global Mental Functions	b121 Consciousness	Observation
		b134 Sleep	PedsQl™ (emotional aspect)
		b140 Attention	PedsQl™ (cognition)
		b144 Memory	PedsQl™ (cognition)
		b147 Psychomotor	AIMS and Denver II
		b152 Emotional	PedsQl™ (emotional aspect)
		b140 Attention	Observation
		b167 Language	Observation
	2- Sensory functions and pain	b210 Seeing	Denver II
		b230 Hearing	Observation
		b235 Vestibular	Denver II (gross motor)
		b260 Proprioception	Denver II (gross motor)
		b265 Tactile	Observation
		b280 Pain	PedsQl™ (physical capacity)
	3- Voice and speech functions	b310 Voice	Denver II (language)
		b340 Alternative vocalization	Denver II (language) and PedsQl™ (cognition)
	4- Functions of the cardiovascular and respiratory systems	b410 Heart	PedsQl™ (physical symptoms)
		b440 Respiration	PedsQl™ (physical symptoms)
		b499 Cardiovascular and unspecified respiration	PedsQl™ (physical capacity and physical symptoms)
	5- Functions of the digestive and metabolic systems	b510 Ingestion	Denver II (personal-social) and PedsQl™ (physical symptoms)
		b525 Defecation	PedsQl™ (physical symptoms)
		b530 Weight maintenance	Health Handbook (Z-score)
		b535 Associated sensations	PedsQl™ (physical symptoms)
		b560 Growth maintenance	Health Handbook
	7- Neuromusculoskeletal and movement related functions	b710 Mobility of joint	AIMS and Denver II (global and fine motricity)
		b730 Muscle power	AIMS and Denver II (global and fine motricity)
		b735 Muscle tone	Anamnesis and Health Handbook
		B750 Motor reflexes	Anamnesis and Health Handbook
		b760 Control of voluntary movements	
		b765 Control of voluntary movements	AIMS, Denver II (global and fine motricity), PedsQl™ (physical capacity) Anamnesis and Health Handbook
	8- Functions of the skin	b899 Unspecified skin functions	PedsQl™ (physical symptoms)
Structure	1- Structure of the nervous system	s110 Brain	Anamnesis
		s120 Spinal cord	Anamnesis
	4- Structure of the cardiovascular, immunological and respiratory systems	s410 Cardiovascular system	Anamnesis
		s430 Respiratory system	Anamnesis
	5- Structures related to the digestive, metabolic and endocrine systems	5- Unspecified structures related to the digestive, metabolic and endocrine systems	Anamnesis
	7- Structures related to movement	s710 Head and neck region	Anamnesis
		s720 Shoulder region	Anamnesis
		s730 Upper extremity	Anamnesis
		s720 Pelvis	Anamnesis
		s730 Lower extremity	Anamnesis
		S760 Trunk	Anamnesis
	8- Skin and related structures	s899 Unspecified skin and related structures	PedsQl™ (physical symptoms)
Activity and Participation	1- Learning	d110 Watching	Denver II (fine motricity)
		d115 Listening	Denver II (language and personal-social)
		d120 Other intentional sensory perceptions	Anamnesis
		D130 Imitating	Denver II (personal-social) and PedsQl™ (cognition)
		d132 Acquisition of language	Denver II (language) and PedsQl™ (cognition)
		d155 Acquisition of basic skills	Denver II (personal-social)
		d160 Focus	PedsQl™ (cognition)

(continues)

Chart 1. Continuation

ICF			
Component	Domains	Categories	Assessment instruments
Activity and Participation	2- General tasks and demands	d210 Undertaking a single task d250 Controlling one's own behavior	Denver II (personal-social) and PedsQl™ (cognition) Denver II (personal-social)
	3- Communication	b310 Voice b315 Communicating with – receiving – non-verbal messages b330 Speaking b331 Pre-linguistic productions b335 Production of non-verbal messages	PedsQl™ (emotional aspect) PedsQl™ (social interaction and cognition) Denver II (language) and PedsQl™ (cognition) Denver II (language) Denver II (language) Denver (personal-social)
	4- Mobility	d410 Changing the basic positions of the body d4100 Lying down d4101 Crouching d4101 Kneeling d4103 Sitting d4104 Standing d4105 Leaning d4106 Changing the body's center of gravity d4107 Rolling d415 Maintaining body position d4150 Remain lying down d4151 Remain crouching d4152 Remain kneeling d4153 Remain sitting d4154 Remain standing up d4155 Maintaining head position d420 Moving d4201 Moving while lying down d440 Fine hand use d4400 Picking up d4401 Grasping d4402 Manipulating d4403 Releasing d445 Hand and arm use d4450 Pulling d4451 Pushing d4452 Reaching d4454 Throwing d450 Walking d455 Moving d4550 Crawling d4551 Climbing d4552 Running d453 Jumping d4558 Moving, others d460 Moving around different locations	AIMS, Denver II (global motricity) and PedsQl™ (physical capacity) AIMS, Denver II (global motricity) and PedsQl™ (physical capacity) AIMS, Denver II (global motricity) and PedsQl™ (physical capacity) Denver II (fine motricity) Denver II (fine motricity and personal-social) AIMS, Denver II (global motricity) and PedsQl™ (physical capacity) AIMS, Denver II (global motricity) and PedsQl™ (physical capacity) AHEMD-IS (variety of stimulation)
	5- Self Care	d510 Washing oneself d540 Dressing d550 Eating d560 Drinking	Denver II (personal-social) Denver II (personal-social) Denver II (personal-social) Denver II (personal-social)
	7- Interpersonal interactions and relationships	d710 Basic interpersonal interactions d760 Family relationships	PedsQl™ (emotional aspect and social interaction) PedsQl™ (emotional aspect and social interaction), AHEMD-IS (variety of stimulation); Mother-child bond

(continues)

Chart 1. Continuation

ICF			
Component	Domains	Categories	Assessment instruments
Activity and Participation	8- Major life areas	d810 Informal education d815 Early childhood education d880 Involvement in playing	Anamnese, AHEMD-IS (stimulation variety) Anamnesis AHEMD-IS (variety of stimulation)
Environmental Factors	1- Products and technology	e165 Goods	Anamnesis, ABEP and AHEMD-IS
	3- Support and relationships	e310 Nuclear family e340 Caregivers and personal assistants e355 Health professionals	Anamnesis and AHEMD-IS Anamnesis Anamnesis
	5- Services, systems and policies	e580 Related to health	Health Handbook
Personal Factors	A- Family Socioeconomic condition		Anamnesis and ABEP
	Stimulation Physical Space Toys		AHMED-IS
	B- Daycare center		Anamnesis

AIMS: Alberta Infant Motor Scale; Denver II: Denver II Screening Test; PedSQl™: Pediatric Quality of Life Inventory; AHEMD-IS: Affordance in the Home Environment for Motor Development-Infant Scale; ABEP: Brazilian Association of Research Companies for Brazil.

Through the systematization and use of the core set we observed that the joint use of several instruments is necessary to respond to all domains and main categories. The anamnesis proposed by Araujo et al.[3] presents information that respond to various categories of all ICF components. The AIMS, Denver II, DNPM scales and PedsQl™, an instrument to assess quality of life, respond to the components of function, activity and participation. Moreover, some items are answered by observing the infant during the application of the instruments and depend directly on the evaluator's experience.

The ICF components related to environmental and personal factors are answered by anamnesis, AHEMD-IS and ABEP. Since some categories cited in the core set do not exist in the most current version of ICF and are not measured in a specific way they were removed. This happened for category b125 (intrapersonal functions), b163 (basic cognitive functions) and d131 (learning through interaction with objects).

Despite being removed from the final version of the ICF, other items were maintained due to being in the checklist of ICF-CY and in the core set, such as: b560 (growth maintenance), considered important and of easy monitoring by the very Caderneta da Criança and kept in the table, d250 (controlling oneself behavior), was also maintained and measured by PedsQl, d331 (pre-linguistic productions), measured by Denver II, d880 (learning through playful activities), measured by AHEMD-IS. Item d133 (acquisition of additional language) does not apply to this proposal and was removed.

Similarly, some categories indicated by the core set for infants do not present specific instruments and do not have objectives related to the intervention program, such as: b121 (consciousness), b156 (perceptiveness), b167 (mental language), b230 (hearing), b265 (tactile function), and can be descriptively evaluated without a specific instrument in the presence of signs and symptoms.

Some items not mentioned in the core set but judged important in the context of early intervention were added: d760 (family relationships), measured by AHEMD-IS, PedsQl™ and vínculo mãe-bebê, d810 (informal education), investigated by anamnesis and AHEMD-IS, and d815 (early childhood education), verified by anamnesis.

Some categories indicated by the core set do not apply to this proposal: (1) Related to products and technologies: e110 (for personal consumption of food and medicines), e115 (for personal use in daily living), e120 (for facilitating mobility and personal transport), e125 (for communication); (4) Related to attitudes: e410 (individual attitudes of members of the immediate family), e440 (individual attitudes of personal caregivers and personal assistants), e450 (individual attitudes of health professionals); (5) Related to services, systems and

policies: e540 (related to transport), e570 (related to social security), e575 (related to general social support).

For the category e580 (related to health), the intervention program in the daycare center, with evaluation and action, is a facilitator of the NPMD of each infant.

Functions and structures of the skin are not mentioned in the core set by Pan et al.[4] but were added, since they account for important afferent information and PedsQl™ presents an item for this.

DISCUSSION

It is known that a single instrument capable of identifying delays in all NPMD areas does not exist; thus, it is necessary to adopt evaluation strategies that include information on clinical evaluation, parental report, and the use of scales and follow-up of child development[19].

By using the ICF and the core set for early stimulation[4] we identified the main domains and categories of interest to identify low-cost instruments for use in early intervention programs, and systematized each category with regard to each instrument to serve as a guide for professionals to organize their assessments.

Although the use of the ICF is not yet so widespread in Brazil[20], the WHO suggests its use to contemplate the evaluation of individuals – in this case, of the infants in an integral way – and facilitate communication among professionals.

The integrality of the ICF was confirmed in this study, and all listed instruments responded to more than one domain of this classification. No instrument was able to contemplate all aspects related to an infant's health condition separately; however, in an integrated way, it was possible to establish assessment instruments with adaptation and/or validation for Brazil and of low cost. The instruments listed were AIMS, Denver II, PedsQl™, AHEMD-IS, Mother-child bond, an anamnesis protocol (as proposed by Araujo et al.[3]) and ABEP.

The AIMS is a scale with more than 20 years of use and revalidated to assess the gross motricity of infants aged 0 to 18 months[14], and despite no translated version for Brazil existing, there are already scores and percentiles indicated for the Brazilian population[21]. The use of the evaluation form is easy and inexpensive – even in English language – because it is a very visual instrument, with drawings illustrating the motor milestone/skill and short tips below them. Moreover, the Brazilian scores[21] represent the reality of the country, following the assumptions of the contextual influences that must be considered. This scale enables the evaluation of components of functions, activity and participation of ICF related to motricity, the establishment of whether NPMD is within typical or suspicious patterns (risk/delay), as well as the monitoring of the evolution of the NPMD.

AIMS is cited in NPMD assessments in Brazilian and foreign studies[22,23], having been indicated as a screening assessment instrument by the Brazilian Ministry of Health for infants at risk of developing problems regarding NPMD[24]. A limitation of AIMS is not being sensitive in the discrimination of developmental percentiles from 14 months onward, and in these cases it should be used with caution and preferably associated with other instruments.

For the authors of the Canadian scale, delay is considered when infants younger than eight months are within the <10 percentile, and within the <5 percentile for infants aged eight months or older[26]. For the Brazilian population, delay is considered for children in the <5 percentile, suspect if between >5 and ≤25 percentile, and typical if >25 percentile[25,27,28]. More than divergences, such choice of the evaluator/researcher in the "cutoff" point especially depends on one's objective between screening more infants suspected of delay (sensitivity) or not (specificity)[29], and this decision may be related to other situations of vulnerability and/or risk.

Widely used worldwide[30], Denver II is the most used screening test in Brazil[31]. As advantages, it presents cultural adaptation to the Brazilian population and evaluation and training kits available for acquisition[32], with relatively low cost[33], which facilitates its use. It presents a rapid evaluation for application (20-30 minutes) and can be used in infants and children up to 6 years, through direct observation of specific items to their age, in each area/domain of the scale[34]. It thus enables the identification and evaluation of ICF's domains of function, activity and participation related to NPMD regarding the aspects gross motor, fine-adaptive motor, language, and personal-social[33], thus complementing the evaluation of AIMS. A limitation of Denver II is not being discriminative before six months of age[35], reinforcing the need for NPMD assessments with instruments used in an integrative way.

The score is given by correctly performing the item ("passed"), error in the execution ("failed"), refusal by the child to perform the item ("refusal"), also having items not evaluated due to the impossibility of the evaluator to test any of them ("not evaluated" or "no opportunity"). At the end, the infant can be classified as "questionable" or "normal" (typical)[33]. NPMD will be questionable if the

infant presents more than one failure and one caution, and typical if there are no failures with a single caution at most. Some works categorize in "typical", "questionable" and "delayed". For these cases, if it is a failure and one or two cautions, development will be considered "questionable", and if it presents two or more failures it will be considered as "delay" or "suspicion of delay" in NPMD[35]. Again, this cutoff point should be considered by the evaluator/researcher in relation to one's objective since Denver II is a screening instrument and not a diagnosis one, and if alterations do exist, more specific investigations related to health condition may be required.

To complement categories not existing in AIMS and Denver II – for functions, activity and participation of the ICF – with the objective of verifying the quality of life, a fundamental component of analysis in the establishment of the effects of intervention programs[36], we identified the Pediatric Quality of Life Inventory (PedsQl™) for infants in its Brazilian version, tested for validity and reliability to be used in infants from 1-12 months and 13-24 months[16]. The Portuguese version of PedsQl™ was obtained for research with permission to use from Mapi Research Trust.

This instrument is available free of charge for research projects if permission to use is requested. The evaluation is rapid, via an interview with the infant's parents and/or caregivers[16]. The application can also be made through forms on the internet or by telephone given that there is no difference in the responses between the forms of application[37]. This instrument enables the assessment of the quality of life in relation to physical capacity, physical symptoms, emotional aspects, social interaction and cognition of the infant, in addition to a total score[16].

The questionnaire uses a conversion from a Likert scale with five scales, from 0 (never) to 4 (almost always), transformed into percentages, considering that the higher the percentage value, the better the quality of life[16,37]. However, there are no referential values of what would be "good quality of life" for infants, thus being a gap to be investigated.

Regarding the NPMD, interpersonal relations aspects were considered since, in this case, knowing the dynamics of the mother-child relationship can facilitate the comprehension of aspects related to the infant's development given that the mother is the provider of care most of the time[38]. It is suggested that, in the impossibility of applying the questionnaire with the mother, the closest caregiver should be interviewed.

Since the previously mentioned instruments focus on functions, activity and participation, for issues related to environmental and personal factors, socioeconomic issues must be investigated. This is possible by observing the absolute value of declared income, as well as by the socioeconomic classification, in Brazil, ABEP[39]. The declared value does not always correspond to consumption practices because there is evidence that low-income families sometimes present higher consumption standards, not necessarily reflecting better living conditions[40].

Another resource that can complement consumption issues – in the case of infants, those focused on the stimulation received – is AHEMD-IS, an instrument with Brazilian validation, of fast use and made available free of charge. It consists of an interview with the infant's caregiver to investigate issues related to the home environment, physical space, variety of stimulation, toys of gross and fine motricity, having a classification in the end that allows the identification of whether this stimulation in the home environment is adequate or not to the infant's needs. The instrument is available in two versions: 3-18 months[41] and 18-42 months[17]. The instrument has been used in the investigation of daycare environments in its initial 41-items version[42]; however, it was not validated for this purpose.

To obtain an interview script with neonatal data and complement data not contemplated by this scale, we suggest a general anamnesis. The anamnesis suggested by this study is the one proposed by Araujo et al.[3], which contemplates the main items related to NPMD. However, this anamnesis can and must be adapted to the clinical and/or research context of the evaluator.

This study does not intend to propose a closed systematization but suggests that, over time, new instruments are inserted. Thus, we sought to conduct a search and systematization of low-cost instruments to facilitate the organization of intervention programs.

The organization aspect of these evaluation instruments facilitates the logic of identification of categories so they are sequentially measured when considering the variability of NPMD[43] and which risk and delay situations can be identified in early stages. It also facilitates the identification of the effects of intervention programs in a broader way, allowing that the promotion of actions of development to be thought from the direct stimulation of infants in the daycare environment, by health professionals and guidance of teachers/caregivers, as well as at home by instructing caregivers/parents.

As limitations to the study, we cite the difficulty of finding Brazilian instruments specifically created for the Brazilian reality in the literature, considering that most are translations and/or cultural adaptations.

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APPENDIX

Form with the systematization of the ICF domains for patient classification
Child's name: _____ Date: _____
Legal Guardian: _____
Professional: _____

Classification regarding Body Functions

Body Functions (b)	0	1	2	3	4	8	9
b121 Consciousness							
b134 Sleep							
b140 Attention							
b144 Memory							
b147 Psychomotor							
b152 Emotional							
b140 Attention							
b167 Language							
b210 Seeing							
b230 Hearing							
b235 Vestibular							
b260 Proprioception							
b265 Tactile							
b280 Pain							
b310 Voice							
b340 Alternative vocalization							
b410 Heart							
b440 Respiration							
b499 Cardiovascular and unspecified respiration							
b510 Ingestion							
b525 Defecation							
b530 Weight maintenance							
b535 Associated sensations							
b560 Growth maintenance							
b710 Mobility of joint							
b730 Muscle power							
b735 Muscle tone							
B750 Motor reflexes							
b760 Control of voluntary movements							
b765 Control of voluntary movements							
b899 Unspecified skin functions							

0: No disability; 1: Slight disability; 2: Moderate disability; 3: Severe disability; 4: Complete disability; 8: Non-specified1; 9: Not applicable.

Classification regarding body structures

Body structures	Extension							Nature									Location									
s110 Brain	0	1	2	3	4	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9
s120 Spinal cord																											
s410 Cardiovascular system																											
s430 Respiratory system																											
5- Unspecified structures related to the digestive, metabolic and endocrine systems																											
s710 Head and neck region																											
s720 Shoulder region																											
s730 Upper extremity																											
s720 Pelvis																											
s730 Lower extremity																											
S760 Trunk																											
s899 Unspecified skin and related structures																											

Extension
0: No disability; 1: Slight disability; 2: Moderate disability; 3: Severe disability; 4: Complete disability; 8: Non-specified1; 9: Not applicable.
Nature
0: No changes; 1: Complete absence; 2: Partial absence; 3: Additional part; 4: Aberrant dimensions; 5: Discontinuity; 6: Deviant position; 7: Qualitative changes in the structure, including fluid accumulation; 8: Unspecified1; 9:; 9: Not applicable.
Location
0: More than one region; 1: Right side; 2: Left side; 3: Both sides; 4: Forward part; 5: Back part; 6: Proximal; 7: Distal; 8: Unspecified1; 9:; 9: Not applicable.

Classification regarding Activity and Participation

Activity and Participation	0	1	2	3	4	8	9
d110 Watching							
d115 Listening							
d120 Other intentional sensory perceptions							
D130 Imitating							
d132 Acquisition of language							
d155 Acquisition of basic skills							
d160 Focus							
d210 Undertaking a single task							
d250 Controlling one's own behavior							
b310 Voice							
b315 Communicating with – receiving – non-verbal messages							
b330 Speaking							
b331 Pre-linguistic productions							
b335 Production of non-verbal messages							
d410 Changing the basic positions of the body							
d4100 Lying down							
d4101 Crouching							
d4101 Kneeling							
d4103 Sitting							
d4104 Standing							
d4105 Leaning							
d4106 Changing the body's center of gravity							
d4107 Rolling							
d415 Maintaining body position							

(continues)

Continuation

Activity and Participation	0	1	2	3	4	8	9
d4150 Remain lying down							
d4151 Remain crouching							
d4152 Remain kneeling							
d4153 Remain sitting							
d4154 Remain standing up							
d4155 Maintaining head position							
d420 Moving							
d4201 Moving while lying down							
d440 Fine hand use							
d4400 Picking up							
d4401 Grasping							
d4402 Manipulating							
d4403 Releasing							
d445 Hand and arm use							
d4450 Pulling							
d4451 Pushing							
d4452 Reaching							
d4454 Throwing							
d450 Walking							
d455 Standing							
d4550 Crawling							
d4551 Climbing							
d4552 Running							
d453 Jumping							
d4558 Moving, others							
d460 Moving around different locations							
d510 Washing oneself							
d540 Dressing							
d550 Eating							
d560 Drinking							
d710 Basic interpersonal interactions							
d760 Family relationships							
d810 Informal education							
d815 Early childhood education							
d880 Involvement in playing							

0: No disability; 1: Slight disability; 2: Moderate disability; 3: Severe disability; 4: Complete disability; 8: Non-specified1; 9: Not applicable.

Classification regarding Environmental Factors

Environmental Factors	Barriers					Facilitators					
	1	2	3	4	0	+1	+2	+3	+4	8	9
e165 Goods											
e310 Nuclear family											
e340 Caregivers and personal assistants											
e355 Health professionals											
e580 Related to health											

0: No facilitator/barrier; 1: Slight facilitator/barrier; 2: Moderate 3: Severe facilitator/barrier; 4: Complete facilitator/barrier; 8: Unspecified1; 9:; 9: Not applicable.