

## Proposal of a roadmap for the assessment of environmental factors in children and adolescents from the ICF perspective

### Proposta de roteiro para avaliação dos fatores ambientais de crianças e adolescentes sob a perspectiva da CIF

Lilian de Fátima Dornelas<sup>1</sup> Érica Cesário Defilipo<sup>2</sup> <sup>1</sup>Corresponding author. Universidade Federal de Mato Grosso do Sul (Campo Grande), Mato Grosso do Sul, Brazil. lilian.dornelas@ufms.br<sup>2</sup>Universidade Federal de Juiz de Fora (Governador Valadares), Minas Gerais, Brazil. erica.defilipo@ufjf.br

**ABSTRACT | INTRODUCTION:** The International Classification of Functioning, Disability and Health (ICF) points out that environmental factors constitute the physical, social and attitudinal environment in which people live and conduct their lives, and it can act as a facilitator or a barrier. In the field of neurofunctional physical therapy for children and adolescents, the environment has been highlighted as an important component in the process of evaluation, establishment of goals and in the choice of interventions aimed at social participation.

**OBJECTIVE:** To propose a script of questions that involve the main environmental factors related to children and adolescents from the ICF perspective, aiming to guide the professional in the assessment process. **METHODOLOGY:** Descriptive study that involved the identification of the most appropriate ICF categories for the main items corresponding to a script of questions to assess factors of the physical, attitudinal and social environment in the area of neurofunctional physiotherapy for children and adolescents. The construction of the script of questions for evaluation took place in 5 phases. **RESULTS:** The script proposed in an interview format was composed of 12 questions with 30 categories that assess the physical, attitudinal and social environment in the neurofunctional area of children and adolescents. The answer option was according to the qualifiers and it was transported to a visual scale. **CONCLUSION:** The proposal of a roadmap for the assessment of environmental factors can help in the investigative process of facilitators and barriers in the environment of children or adolescents.

**KEYWORDS:** Environment. International Classification of Functioning, Disability and Health. Child. Physiotherapy.

**RESUMO | INTRODUÇÃO:** A Classificação Internacional de Funcionalidade, Incapacidade e Saúde (CIF) aponta que os fatores ambientais constituem o ambiente físico, social e atitudinal no qual as pessoas vivem e conduzem suas vidas, podendo atuar como facilitador ou barreira. Na área da fisioterapia neurofuncional da criança e do adolescente, o ambiente tem sido destacado como um importante componente no processo de avaliação, estabelecimento de metas e na escolha de intervenções voltadas para a participação social. **OBJETIVO:** Propor um roteiro de perguntas que envolvam os principais fatores ambientais relacionadas às crianças e adolescentes sob a perspectiva da CIF, visando nortear o profissional no processo de avaliação. **METODOLOGIA:** Estudo descritivo que envolveu a identificação das categorias da CIF mais apropriadas para os principais itens correspondentes a um roteiro de perguntas para avaliação de fatores do ambiente físico, atitudinal e social na área da Fisioterapia neurofuncional da criança e do adolescente. A construção do roteiro de perguntas para avaliação se deu em 5 fases. **RESULTADOS:** O roteiro proposto em formato de entrevista foi composto por 12 perguntas com 30 categorias que avaliam o ambiente físico, atitudinal e social na área neurofuncional da criança e do adolescente. A opção de resposta foi de acordo com os qualificadores e transportados para uma escala visual. **CONCLUSÃO:** A proposta do roteiro de avaliação dos fatores ambientais pode ajudar no processo investigatório sobre facilitadores e barreiras no ambiente da criança ou do adolescente.

**PALAVRAS-CHAVE:** Meio Ambiente. Classificação Internacional de Funcionalidade, Incapacidade e Saúde. Criança. Fisioterapia.

## Introduction

The environment can have either a positive or a negative influence on the performance of the individual as a member of society, on his/her ability to perform actions or tasks, or even on his/her body function and structure. An environment with barriers can restrict the performance of the individual, whereas a more facilitating environment can improve such performance.<sup>1</sup> Thus, the environmental factors, although they are extrinsic to the individual, have an impact on health condition and the individual's health or health-related states.<sup>2</sup>

The environmental factors are considered an essential component of the International Classification of Functioning, Disability and Health (ICF) and describe, together with the personal factors, the context in which the individual is inserted.<sup>3</sup> The ICF use has been recommended in the scientific literature as a way of addressing the individual as a whole, from the biopsychosocial perspective, including all health components.<sup>4</sup>

In the neurofunctional area for the child and the adolescent, the literature has highlighted the importance of the child's social participation, by focusing on the assessment process, the setting of the goals, and the choice of interventions aimed at the participation components and the environmental factors.<sup>5</sup> Anaby et al.<sup>6</sup> (2013) observed that the participation and the quality of life of physically disabled children were restricted and that they were directly related to the presence of social and attitudinal barriers, such as the systems and policies, support and relationship, which prevent the child's full development.

Studies<sup>7-10</sup> have investigated the home, the school, and the community's role in the participation of children and adolescents. Nonetheless, disabled children tend to have more barriers when they are compared to their peers in typical development.<sup>11,12</sup> The reasons seem to be related to not taking the children's preferences, parents' negative attitudes, lack of knowledge and abilities from the professionals, inadequate places, lack of transportation, accessibility, and programs bound to this population into account, in addition to the high cost. On the other hand, the participation promoters involve the child's wish to be capable, motivated, and active, the involvement with classmates, the family support, nearby and accessible

places, opportunities, skill practices, and the qualified and engaged sports and recreation personnel.<sup>12</sup>

In view of the extent of the factors that involve the environment, that is, from the physical, attitudinal, and social ones, the current study aims to propose a roadmap of questions that involve the main environmental factors related to children and adolescents from the ICF perspective, in order to help guide the assessment by reaching the main goal that is to identify more relevant barriers and facilitators of the environment experienced by the child or the adolescent.

## Methodology

A descriptive study that involved the identification of the ICF most appropriate categories for the corresponding items to a script of questions for the assessment of the physical, attitudinal and social environmental factors in the child and adolescent neurofunctional area.

Two researchers who are specialists in the child and adolescent neurofunctional physiotherapy area and with ICF knowledge participated in this process.

The construction of the assessment roadmap occurred in 5 phases:

1<sup>st</sup> Phase: Discussion between the authors on the main items that have to compose an environment assessment of children and adolescents.

2<sup>nd</sup> Phase: Search, chapter-by-chapter, of the most frequent categories in the scope of children and adolescent environments.

3<sup>rd</sup> Phase: Discussion and construction of visual scales that enabled to represent the extension in which the environment factor acts either as a barrier or as a facilitator.

4<sup>th</sup> Phase: Structuring of questions and possibilities of answers and inclusion of the ICF codes.

5<sup>th</sup> Phase: Roadmap structuring and organization in the Microsoft® Word© program so that the environmental assessment follows a logical and practical reasoning in order to be used by the professionals.

The script proposal was created to be directly applied to the child, in the cases in which he/she is able to understand and answer the questions. When it is not possible, the interview can be applied to parents, caretakers, or guardians. In these cases, it is important to ensure that the respondent is from the child or the adolescent coexistence. The definition of whether it will be either a barrier or a facilitator will depend on the person who is experiencing the circumstance, that is, from the child or the adolescent perspective.

The visual scales were created in order to approach and facilitate ICF use in the daily clinical routine that deals with children and adolescents. Available images from the website <https://br.freepik.com>, as well as “cool and warm” colors were used. In the first negative visual scale (Barrier), “warm” colors (red, orange, and yellow) were selected to represent the severity extension, and the ideograms with sad expressions to convey the negative aspect of the environmental factor. Regarding the positive visual scale (Facilitator), “cool” colors (blue, violet, and green) to express the resource effectiveness, and the ideograms with happy expressions were listed to indicate the positive aspect of the environmental factor. In both scales, the grey color was chosen for being neutral, characterizing the qualifier as neither a barrier nor a facilitator. Furthermore, the visual scales were arranged in columns with different sizes to demonstrate the classes of percentages, which represent the barrier/facilitator quantification according to the ICF. Example: the moderate barrier (25-49%) represents almost half of the severe barrier (50-95%), and, thus, its column was represented in a smaller size.

During the interview, when the respondent answers that the environmental factor does not help, the interviewer automatically presents the negative visual scale and asks the respondent to show HOW MUCH it is a barrier from the frequency perspective, presence (e.g.: negative attitudes) or even absence (e.g.: no access to the rehabilitation services), by means of the qualifiers: complete, severe, moderate, mild or none. If the answer is that the environmental factor helps, the respondent will be guided to indicate HOW MUCH it is a facilitator, using the positive visual scale, considering the resource availability, accessibility or its good quality, by means of the qualifiers: complete, considerable, moderate, mild or none.


At the end of the construction process, another researcher with ICF experience took the instrument reading and proposed suggestions and adjustments. At no point in the roadmap construction phase, there was any conflict of interest between the authors and their institutions.






## Results

The script consisted of 12 questions with 30 categories related to environmental factors, considering that: ten categories were selected from Chapter 1, concerning Products and Technology; two categories from Chapter 2, which include natural Environment and Human-made Environmental Changes; nine categories from Chapter 3, which portrays Support and Relationships; five categories from Chapter 4 on Attitudes and; at last, four categories from Services, Systems and Policies in Chapter 5. Two visual scales (negative and positive) that denote the extent to which an environmental factor acts either as a barrier or as a facilitator were presented at the beginning of the script in order to guide how to answer the questions. The roadmap content is described in **Table 1**.


**Table 1.** Roadmap for assessing the physical, attitudinal and social environment factors in the child and adolescent neurofunctional area (to be continued)






Name of child or adolescent: \_\_\_\_\_  
 Age: \_\_\_\_\_ Date: \_\_\_\_\_  
 Responsible person: \_\_\_\_\_



NONE .0	MILD .1	MODERATE .2	SEVERE .3	COMPLETE .4
				

**Negative visual scale:** it indicates the extension in which the environmental factor acts as a **BARRIER**



NONE +0	MILD +1	MODERATE +2	CONSIDERABLE +3	COMPLETE +4
				

**Positive visual scale:** it indicates the extension in which the environmental factor acts as a **FACILITATOR**

**Note:** For non-specified or non-applicable situations, use:  
 .8 Non-specified barrier; +8 Non-specified facilitator; 9 Non-applicable

Questions	Place the qualifier in the space according to the facial color/expression chosen by the respondent.  For Barrier: only one decimal point and the qualifier For Facilitator: the "+" sign and the qualifier
<p><b>1-</b> Who does (Name of child or adolescent) live with?                      ( ) mother ( ) siblings ( ) cousins ( ) uncles ( ) grandparents ( ) father                      ( ) others _____                      How much physical or emotional support does he/she offer (Name of child or adolescent)?                      What are the attitudes of this family member toward the child or the adolescent?</p>	<p><b>e310</b> __ (nuclear family) <b>e315</b> __ (extended family)  <b>e410</b> __ (nuclear family member attitudes) <b>e415</b> __ (extended family member attitudes)</p>
<p><b>2-</b> Who does (Name of child or adolescent) stay with most of the time?                      ( ) mother ( ) siblings ( ) cousins ( ) uncles ( ) grandparents ( ) father ( ) others _____                      How much physical or emotional support does he/she offer (Name of child or adolescent)?</p>	<p><b>e310</b> __ (nuclear family) <b>e 315</b> __ (extended family)</p>
<p><b>3-</b> Does (Name of child or adolescent) have a caretaker (babysitter)?                      ( ) yes ( ) no                      How much physical or emotional support does he/she offer (Name of child or adolescent)?</p>	<p><b>e340</b> __ (caretakers and personal assistants)</p>
<p><b>4-</b> Is there any pet at home?                      ( ) yes. Mention it: _____ ( ) no                      How much physical or emotional support does this pet offer (child or adolescent)?</p>	<p><b>e350</b> __ (pets)</p>
<p><b>5-</b> Does (Name of child or adolescent) have any friends?                      ( ) yes ( ) no                      How much physical or emotional support do friends offer the child or adolescent?                      How the friends' attitudes toward the child or adolescent are</p>	<p><b>e320</b> __ (friends)  <b>e420</b> __ (friends' attitudes)</p>
<p><b>6-</b> (Name of child or adolescent) uses some health service (FHS, Hospital, etc.):                      ( ) yes. What service? _____                      ( ) no                      How much does the health service meet the needs of (Name of child or adolescent)?                      Does (Name of child or adolescent) have health care with health professionals (physiotherapist, speech therapist, psychologist, etc.)?                      How much physical or emotional support does he/she offer (Name of child or adolescent)?                      How are the attitudes of the professionals toward the child or adolescent?</p>	<p><b>e5800</b> __ (health services)  <b>e355</b> __ (health professionals)  <b>e450</b> __ (health professional attitudes)</p>

**Table 1.** Roadmap for assessing the physical, attitudinal and social environment factors in the child and adolescent neurofunctional area (conclusion)

Questions	Place the qualifier in the space according to the facial color/expression chosen by the respondent.  For Barrier: only one decimal point and the qualifier For Facilitator: the "+" sign and the qualifier
<p><b>7-</b> Does (Name of child or adolescent) go to school? ( ) yes. What school? _____ ( ) no</p> <p>How much does the school meet the needs* of (Name of child or adolescent) at the educational level that he/she is? _____</p> <p>*tutors, assistant teachers/professors, physical adaptations, inclusive activities</p> <p>To what extent is the school accessible to (Name of child or adolescent)? _____</p> <p>How much physical or emotional support does the teacher/professor offer (Name of child or adolescent)? _____</p> <p>How are the professor/teachers' attitudes toward the child or adolescent? _____</p>	<p><b>e5850</b> ____ (education and training services)</p> <p><b>e1501</b> ____ (products and technology)</p> <p><b>e360</b> ____ (other professionals: teacher/professor)</p> <p><b>e455</b> ____ (teachers/professors' attitudes)</p>
<p><b>8-</b> Does (Name of child or adolescent) use any equipment to go indoors and outdoors (car, bus, wheelchair, walker, crutches, tricycles, power-operated devices)? ( ) yes. What equipment? _____ ( ) no</p> <p>How much does this equipment meet the needs of (Name of child or adolescent)? _____</p>	<p><b>e120</b> ____ (mobility technologies and products)</p>
<p><b>9-</b> In (Name of child or adolescent) neighborhood, is there any water supply, electricity, sanitation, public transportation, and essential services (such as bakery, drugstore, supermarket, shops) easily accessible? ( ) yes ( ) no</p> <p>How much do these services meet the need of (Name of child or adolescent)? _____</p>	<p><b>e5300</b> ____ (public utility services)</p>
<p><b>10-</b> In (Name of child or adolescent) neighborhood, are there any services that provide recreation, leisure, sports, and religious service? How much do these services meet the need of (Name of child or adolescent)? _____</p>	<p><b>e5550</b> ____ (services provided by associations/organizations)</p>
<p><b>11-</b> What is the kind of (Name of child or adolescent) housing? ( )urban ( )rural ( )house ( )apartment ( )subnormal agglomerate</p> <p>How is (Name of child or adolescent) access to the house? Types of existing barriers: _____</p> <p>How many rooms are there in the house? _____ ( ) bedrooms ( ) bathrooms ( ) living room ( ) kitchen ( ) free area ( ) others _____</p> <p>Where does the child or adolescent sleep? _____</p> <p>How much are these rooms accessible to (Name of child or adolescent)? Type of existing barriers: _____</p> <p>How are the lighting and the ventilation of the rooms in the house? _____</p>	<p><b>e155</b> ____ (services and technologies for private use)</p> <p><b>e1550</b> ____ (products and architectural technology for the house entrance and exit)</p> <p><b>e1551</b> ____ (products and architectural technology for the house installation access)</p> <p><b>e240</b> ____ (light intensity and quality) <b>e2254</b> ____ (wind)</p>
<p><b>12-</b> What are the medications of frequent use (Name of child or adolescent)? _____</p> <p>What kind of food does (Name of the child or the adolescent) use every day? Example: How is the nutrition of the child? Where does he/she have his/her meals? Who helps him/her to feed himself/herself? _____</p> <p>What adapted equipment for the daily activities (dressing, eating, feeding, intimate hygiene) does (Name of child or adolescent) use? (orthesis/tutor, parapodium/stabilizer, tubes, gastrostomy, tracheostomy, NIV, postural adaptations)? Example: How is the bath? Does he/she use any device/equipment such as a bathing chair, adapted bathtub, among others? _____</p> <p>What adapted equipment for information receipt and transmission does (Name of child or adolescent) use on a daily basis? Example: hearing devices, glasses, lenses, cochlear implants, communication boards, or software for alternative communication? _____</p> <p>Does (Name of child or adolescent) have toys? Which ones? _____</p>	<p><b>e1101</b> ____ (medications)</p> <p><b>e1100</b> ____ (food)</p> <p><b>e1151</b> ____ (assistance products and technologies for personal use in daily life)</p> <p><b>e125</b> ____ (communication products and technology)</p> <p><b>e140</b> ____ (products and technologies for sports and recreational activities)?</p>

Source: The authors (2022).

## Discussion

The current study aimed to propose a script of questions involving the main environmental factors related to children and adolescents from the ICF perspective. Thus, questions contemplating both the individual and the social level in which the environmental factors in ICF are organized were incorporated. In the individual aspect, questions that are closely related to products that can interfere either in the child or adolescent functioning were created, as well as the amount of physical and emotional support that they can receive from persons. In the social aspect, the questions covered both the perspective of the goods provided by services targeted at this clientele and the attitudes of the society that can motivate either positive or negative practices. The intention was to structure the investigation of the environmental factors in the children or adolescents' lives in a practical way, considering the great importance that this health component represents in the biopsychosocial model.<sup>6,7</sup>

The literature<sup>13-15</sup> emphasizes that the environment has different influences, and it assumes a relevant role as it can provide significant experiences to the child and the adolescent. Bearing it in mind, to include elements that corroborate the search for facilitators in the assessment, that is, factors that provide a stimulating environment that enables, protects, and offers adequate attention, as well as to know the factors that are barriers, negatively impacting the development of the child or the adolescent<sup>16,17</sup>, can be a way to contribute to the clinical reasoning of the neurofunctional physiotherapist. The investigation of the environment, either attitudinal, social, or physical, needs to have a purpose so that actions can be developed in order to seek the child or the adolescent autonomy and independence.<sup>18,19</sup>

The home, as the child's first environment, is an extremely important space to develop reception, safety, and well-being by means of the physical structure, the interaction, and the parents' or guardians' support and attitude. Considering the environmental factors, it is worth mentioning that the physical space where the child lives, the family dynamics, the verbal stimulus, the emotional involvement, the quality of the affective bonds, the stimulus variability, and the

socioeconomic conditions are important factors for infantile development.<sup>20</sup> In the study by Pantoja et al.<sup>21</sup>, the significant relation of some environmental factors was verified, such as the worst economic class, the lack of water treatment, absence of electricity and bathroom as a high-risk level for the quality of family stimulus in the community of riverside children. Defilipo et al.<sup>22</sup> carried out a research with 239 children between 3 and 18 months from the municipality of Juiz de Fora (MG) and identified a significant impact between the quality of the house/home environment and socioeconomic risk factors. The parents' economic level seems to be related to greater access to information and consequently to greater knowledge regarding the mechanisms that can generate a more adequate development and stimulating environment for children, regardless of the child's age.

As age advances, the school becomes the most attended environment by children, where social involvement and physical and mental function growth are allowed.<sup>23</sup> Thus, other environmental factors such as mobility devices, recreation, outdoor and group activities, and the practice of sports become part of children's and adolescents' lives. Kemp et al.<sup>24</sup> conducted a review aiming to investigate which environmental factors are associated with the participation of children with cerebral palsy, and they found negative associations with the parents' behavior and the type of school. That is, the parents' stress and attending a special school are associated with a lower involvement and frequency in the participation of the children. The authors highlight that determining which environmental factors are associated with participation is important; however, it is more interesting to establish which factors are modifiable to increase the presence and engagement of the child or the adolescent. For example, the parents' stress can be reduced by providing school and family-centered services via tools that promote socialization or even via policies that ensure the children's right to attend regular schools.

As study limitations, it is highlighted that the variability and the complexity from one child environment to another may not encompass all the ICF categories that were included in the roadmap. Specific regional and social class aspects and the fact that standardization and validation phases for the

current questionnaire were not conducted have to be considered. However, the purpose of the study was to approximate the ICF use, in a facilitated way, to the clinical practice of professionals that deal with this population, reducing the blanks found in the environmental assessment process in the area of child or adolescent neurofunctional physiotherapy. Future studies on this roadmap are necessary to help detect possible deficits or difficulties regarding its use in the daily clinical routine.

The questionnaire format with questions related to the main environments experienced by this public, with the respective ICF categories, can help either in the identification of barriers or facilitators. The proposal can be extrapolated to other contexts, such as school, nursery, or sports, and it can also be used in several levels of health care. It is necessary to seek strategies that facilitate a more contextualized look over the child and the adolescent, in order to plan the goals and choose the most adequate interventions.

## Conclusion

In this study, the proposal of the script of questions for the assessment of environmental factors in children or adolescents from the ICF perspective includes categories from all the referred chapters in this health component. This proposal can help in the investigatory process about possible facilitators and barriers that are present in this target public environment, facilitating the ICF use in the professional daily routine, in addition to serving as a support for therapeutic interventions to the multidisciplinary team and allowing the elaboration of public policies for the construction of a more accessible environment for this population.

## Authors' contribution

Dornelas LF and Defilipo EC participated in the conception, design, questionnaire construction, result interpretation, writing of the article, and final review.

## Conflict of interest

No financial, legal or political conflict involving third parties (government, companies and private foundations, etc.) was declared concerning any aspect of the submitted study (including, but not limited to grants and fundings, participation in advisory board, study design, manuscript preparation, statistical analysis, etc.).

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