Environmental factors: a systematic review of instruments and content analysis using the International Classification of Functioning, Disability and Health.

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Introduction
- Assessing the impact of environmental factors (EF) on patients’ functioning is an important part of the rehabilitation process. Physiotherapists need to know which instruments assess EF, which EF these instruments assess and which methodology of assessment they use, in order to choose the appropriate instrument. The International Classification of Functioning, Disability and Health (ICF) provides a universal framework that can be used to describe and compare the health of patients and that serves as a reference for the documentation in physiotherapy. Therefore it can be used to characterise existing instruments.

Aim
- This study aims to describe and compare the content of instruments that assess EF using ICF.

Methods
- A systematic search of 3 databases (PubMed, CINAHL and PEDro) was conducted to identify instruments that assess EF. Combinations of the following key words were used without language restriction: environment, factors, components, barriers to participation, facilitators to participation, International Classification of Functioning, Disability and Health, social participation. Two investigators independently screened all instruments included, which were identified if developed for adults, addressed more than one 2nd level category of any of the 5 Chapters on EF and not specific to a health condition.

Analysis
- Included instruments had their content examined independently by 2 investigators that identified all meaningful concepts and linked them to the most precise ICF category according to published rules1. Percentage agreement between the 2 investigators varied between 84% and 95%. See Table 1 for examples of linking questions to ICF categories.

Results
- 8 instruments met the inclusion criteria:
  1) Community Health Environment Checklist (CHEC)2
  2) Craig Hospital Inventory of Environmental Factors (CHIEF)2
  3) Facilitators and Barriers Survey (FABS)4
  4) Home and Community Environment Inventory (HACE)5
  5) Individually Prioritized Problem Assessment (IPPA)6
  6) Measure of the Quality of the Environment (MQE)7
  7) Neighborhood Environment Walkability Scale (NEWS)8
  8) ICF checklist

- The 8 instruments contained 558 meaningful concepts linked to 2nd or 3rd level ICF categories from one of the 5 EF chapters (1: Products and technology, 2: Natural environment, 3: Support and relationships, 4: Attitudes, 5: Services and policies).
  - 5/8 instruments cover all 5 chapters;
  - 1/8 instrument covers 4/5 chapters (1, 3-5);
  - 1/8 instrument covers 1/2 chapter (1, 3-5) or 2/8 instrument covers chapter 1 only;
  - 5/8 instruments had between 61% and 100% of their items linked to categories in Chapter 1;
  - the highest percentage of items from one instrument linked to categories in Chapter 2 was 11%, Chapter 3 was 30%, Chapter 4 was 20% and Chapter 5 was 49%;
  - 3/8 instruments assessed whether EF were present or absent in a specific context, 3/8 assessed the intensity of EF impact and 2/8 assessed the intensity and frequency of the EF impact.

Table 1 – Examples of linking questions to ICF categories.

Discussion
- The process of linking instruments to the ICF allows a detailed analysis of the content of instruments and also of their approach to assessment. The ICF-based content analysis provides information that can be very useful when selecting EF instruments for research or clinical practice, not only because it allows insight about the range of domains covered by the instruments, but also the depth of the measurement.
- Overall, instruments have been developed for different purposes, and therefore vary in their content (i.e., EF assessed and approach used to assess EF (i.e., presence and absence of an EF or intensity of EF impact). This heterogeneity is probably a reflection of the complexity of assessing EF, as there are several aspects of interest depending on what is measured or the purpose of the measurement.
- Considering the content of instruments, most (the CHEF, FABS, MQE, NEWS, and ICF checklist) have items and questions that were linked to all 5 ICF chapters, suggesting that they give a broad perspective on the different EF that can influence functioning of the individual.
- The approach to measuring EF also varied and could be broadly classified into those that assess the presence or absence of EF (the CHEF, HACE, and NEWS), those that assess the intensity of the EF impact (the ICF, MQE, and IPA), and those that assess the intensity and frequency of the EF impact (the CHEF and FABS).

Implications
- The results of this study can guide physiotherapists in clinical practice and research in selecting an appropriate EF instrument for a specific purpose.

Conclusion
- Instruments assessing EF differ in their content and type of assessment and have several items linked to the same ICF category. Most instruments are designed to assess primarily products and technology (Chapter 1) and only a few assess the intensity and frequency of EF impact, which is of great relevance to rehabilitation. Different instruments are needed that assess the intensity and frequency of EF impact and that use ICF categories as the assessment.

References
- One question and one meaningful concept linked directly to one category.
- The streets in my neighbourhood are hilly, making my wheelchair difficult to walk in. (CHEF)
- 8100 - Land form; 4100 – Walking.

The attitudes of your service providers (public service agents, salespeople, cashiers, …) toward you. (MQE)
- 4905 - Individual attitudes of health professionals (attitudes of repeatable professional and nonprofessional services agents, salespeople, cashiers).

- One question and more than one meaningful concept linked to more than one category from different chapters and components. Examples are not explicitly named in any ICF category.

Meaningful concepts
- Access to facilities inside buildings for public use
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- Personal equipment or special adapted devices (examples: hearing aids, eyeglasses, wheelchairs).