Validation of the International Classification of Functioning, Disability and Health (ICF) core sets for musculoskeletal conditions in a primary health care setting from physiotherapists' perspective using the Delphi method

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Implications for Rehabilitation

- This study shows which body functions and structures, activities and participation, environmental factors and personal characteristics are relevant from primary care physiotherapists' perspective assessing persons with musculoskeletal conditions.
- The Comprehensive ICF Core Set for Subacute Musculoskeletal Conditions includes most of the categories identified in this study, but they need to be refined to fully represent the primary care physiotherapists' perspective.
- The results of this study support the use of the Comprehensive ICF Core Set for Subacute Musculoskeletal Conditions as a basis for operationalizing ICF in this clinical setting.

Validation of the International Classification of Functioning, Disability and Health (ICF) core sets for musculoskeletal conditions in a primary health care setting from physiotherapists' perspective using the Delphi method

Purpose: To analyze the possibilities of using ICF core sets for musculoskeletal conditions in primary care physiotherapy units of the Health Service of "Castilla y León" (Spain).

Methods: A three-round Delphi study was conducted by physiotherapists working in a primary care setting. The data obtained were linked to second-level ICF categories and their relevance was assessed by the participants. The most relevant categories were compared with those present in the existing ICF core sets for musculoskeletal conditions.

Results: Eighty-four physiotherapists participated in the survey. The consensus was reached for forty-five ICF categories and 5 personal factors after the survey. Thirty-five of these categories were present in the Comprehensive Core Set for post-acute Musculoskeletal Conditions. In addition, 35 categories present in the core set were not considered relevant from the participants' perspective.

Conclusions: Physiotherapists mainly considered movement-related categories as relevant. The ICF core set for post-acute musculoskeletal conditions comprises many of these categories and can therefore be taken as a basis for the adoption of ICF in the clinical context.

Relevance: Primary care physiotherapists should be aware of the advantages of using ICF in their clinical settings.

Keywords: ICF; core set; physical therapy; primary care; musculoskeletal conditions

Introduction

Musculoskeletal conditions are common in the general population and have been estimated to affect over 1.7 billion people worldwide in 2019 [1]. The symptoms of these conditions are varied, involving pain, physical deficits (such as decreased range of motion and/or loss of strength) and alteration of the functional capacity [2]. These clinical features have a great impact on the lives of people, affecting social, occupational and personal aspects [3].

In clinical practice, the diagnosis of musculoskeletal conditions can be performed according to the International Classification of Diseases (ICD). This classification includes more than 150 diagnoses related to this type of pathology. The most frequent are osteoarthritis, spinal pain (cervicalgia and low back pain), fragility fractures, traumatic injuries and some systemic inflammatory diseases (such as rheumatoid arthritis) [2]. In 2019, musculoskeletal conditions constituted the second leading cause of disability worldwide, accounting for 17% of years lived with disability [1]. These disorders are one of the main reasons for consultation in primary care, accounting for up to 18% of all general practitioner consultations [4]. Despite their relevance, these professionals have shown low accuracy in the diagnosis and suboptimal management of musculoskeletal conditions [5-7]. Instead, some authors have proposed that musculoskeletal conditions could be addressed by physiotherapists rather than general practitioners, including triage and direct-access services [4,8-10]. Although the evidence is limited, many studies suggest that physiotherapists can achieve clinical outcomes similar to those of general practitioners but with lower healthcare consumption [11-13]. Therefore, primary care physiotherapists could be determinant to improve the functioning and the quality of life of people suffering from musculoskeletal conditions.

Since musculoskeletal conditions are complex and multifactorial in nature, physiotherapists use a biopsychosocial approach to integrate their multiple dimensions [14]. To achieve this, it is necessary to use terms that accurately describe the functional status of patients. As a reference

system for functioning, the World Health Organization (WHO) proposed the International Classification of Functioning, Disability and Health (ICF) in 2001, as a complement to the more diagnosis-focused ICD. The ICF provides a unified and standardized terminology to describe the functioning of individuals, taking into account contextual (environmental and personal) factors [15]. The ICF is structured in different components (body structures and functions, activities and participation, environmental and personal factors) and consists of more than 1400 categories organized in 4 levels, according to their level of detail. The ICF qualifiers (magnitude, nature, location, etc.) define the degree of impairment, limitation of activity or restriction of the participation [16].

In spite of the advantages of the ICF, there are many difficulties in making it operational. The main use of the ICF in Spain is focused on the description of disability in the population, as shown in some studies [17-19]. There is also experience in the adaptation and validation of measurement tools into Spanish to describe the impact of some conditions within the ICF framework [20]. Nevertheless, although there are some studies that have used the ICF to describe patient experience [21] or professional perspectives [22,23] in other disorders, the use of ICF in musculoskeletal conditions is limited.

Currently, the main challenge is to expand the use of ICF to clinical practice. To achieve this, specific core sets have been developed for a variety of diseases and care settings, including some for musculoskeletal conditions [24-26]. Core sets are selections of ICF categories that represent the most relevant aspects of functioning on a particular condition. The development of core sets is done through an evidence-based process that involves capturing the perspective of researchers, practitioners and patients [27,28]. Despite the existence of core sets for ICF, its application in a specific clinical context requires a validation process. Several validation studies have been carried out and it has been shown that each professional group has a specific view for a particular condition [29,30]. Moreover, this view does not depend exclusively on the

professional group, but the clinical setting has also a very significant influence [31]. In an attempt to overcome this problem, some initiatives have been launched to develop tailor-made core sets to obtain sets of categories that represent the professional's perspective within a particular clinical context [32].

Although the core sets are an important contribution to operationalizing ICF in clinical practice, they are not a substitute for the ICF as a whole and cannot be assumed to represent the perspective of healthcare professionals [33]. In fact, it has been shown that only 66% of the existing ICF core sets have been validated, highlighting the need for further studies [34].

The aims of this study are to describe the perspective of primary care physiotherapists in terms of the ICF and to analyze to what extent their point of view is represented in the ICF core sets for musculoskeletal conditions as a whole in the acute and post-acute context.

The following research questions should be answered by this study:

1. What are the most relevant ICF categories for a primary care physiotherapist when performing a clinical assessment?

- Are the identified aspects represented in the ICF core sets for musculoskeletal conditions?
- Which categories are missing in the ICF core sets for musculoskeletal conditions according to physiotherapists in a primary care setting?
- Which categories present in the core sets are not relevant to primary care physiotherapists?

Materials and methods

Design

A Delphi study was conducted and reported according to the guidelines of Conducting and REporting DElphi Studies (CREDES) [35]. A flowchart illustrates the stages of the Delphi

process (see figure 1). A Delphi technique is a widely used method to obtain input from a group of experts with knowledge of a specific topic [36]. The Delphi methodology is particularly valued for its ability to arrange a geographically dispersed group of participants who are blinded to each other [37].

[Figure 1 near here]

According to the established objectives, and taking into account the variability in the application of this method [36], the authors decided to conduct three Delphi rounds for this study. The objective of the first round was to identify meaningful concepts about clinical assessment in physiotherapy. The information obtained in the first round was linked to the corresponding ICF categories. The purpose of the second round was to identify missing categories and select the most relevant categories from the first round. In the third round, the aim was to judge the relevance of the ICF categories previously identified.

The surveys were conducted over a period of 9 months. The invitation to complete the first survey was sent on June 22, 2020 and the deadline to respond to the third survey was March 24, 2021. An online survey system (Google Forms) was used in all three rounds. For each round, participants had 4 weeks to respond.

The consensus was performed according to percentage agreement [38]. The optimal level of agreement was between 70-80%, as previous authors recommended [36]. Therefore, the cut-off points in this study were established considering an agreement level of 75% as optimal.

Participants

Potential participants were identified accross the eleven health areas of the Spanish region of “Castilla y León”. A health area is an administrative division that serves to manage the provision of health services in the Spanish healthcare system. The physiotherapy coordinators in these areas provided contact information about potential participants, but didn’t contact them to ensure their anonymity.

Inclusion criteria for participants were: (a) physiotherapists currently working in a primary care center in “Castilla y León” region and (b) with more than 2 years of experience in this setting.

There is a general lack of agreement regarding sample size needed to conduct a Delphi study, but it must be balanced between the total amount of information and the difficulties that may be involved in analyzing qualitative data [36]. Therefore, taking as a reference the experiences of previous studies using this methodology [30,39-41], the authors considered a sample size of at least 40 participants to be sufficient. Nevertheless, an attempt was made to recruit as many participants as possible from the target population. Participants who met the eligibility criterion filled out and signed an informed consent form.

Data collection

Data were collected between June 2020 and March 2021. All the participants received a survey by email about characteristics, including age, gender, education level, professional expertise, current position and setting.

Prior to the study, the introduction, survey and instructions were sent to 4 physiotherapists working in a primary health care setting for pilot testing. After a few minor considerations, the final version was reviewed by the research group.

Achieving and maintaining a high response rate in the Delphi rounds is a critical aspect to avoid biased findings in a Delphi study. For this reason, to prevent dropouts and to increase the participation and completion rate, two reminders were sent by e-mail (one week and two days before the deadline) in each round. The stability of the responses was expected to be achieved in these 3 rounds, as some authors have noted as a preferred number of rounds for this purpose [36].

Delphi round I

The first round of the Delphi process consisted of open-ended questions about the components of the ICF. These questions were related to body structures and functions, activities and

participation, environmental factors (barriers and facilitators) and personal factors. Participants were asked to consider these factors as if they were performing a physiotherapy assessment in a clinical setting. The questions were administered in the form proposed by Selb et al. [28] for the development of ICF core sets (see table 1 for more details).

[Table 1 near here]

The responses of the physiotherapists were qualitatively analyzed and linked to the ICF. The linking process is a method for translating health and health related information to the ICF. An ICF category is coded by the component letter and a suffix of 1 to 5 digits. The letters "b," "s," "d," and "e" refer to the components "body functions" (b), "body structures" (s), "activities and participation" (d), and "environmental factors" (e) (see figure 2). The letter is followed by 1 digit indicating the chapter, the code for the second level (2 digits), and the codes for the third and fourth levels (1 digit each). The categories are organized hierarchically, so that the more specific lower-level categories share the attributes of the less specific higher-level category.

The process was carried out independently by two researchers (HLH, JBS), in accordance with the established linking rules [42]. Disagreements were resolved by consensus involving the other two researchers (MGM, CLL). ICF categories reported by at least 5% of the physiotherapists were considered for the second Delphi round [28].

Delphi round II

In this round, the list of ICF categories and the personal factors that were identified in the first round were presented to the participants. The task for the group of physiotherapists was to judge whether each category/personal factor was relevant when they perform a clinical assessment in a patient with a musculoskeletal condition. The definition of each ICF category was provided with inclusion/exclusion examples, such as if it is available in the ICF manual [16] or the ICF browser (http://apps.who.int/classifications/icfbrowser/). For personal factors, the research

group summarized and established a definition which was also presented to the participants according to the findings from the first round.

A 5-points Likert scale was used to rate each category or personal factor. Response options included “not relevant” (score 1), “hardly relevant” (score 2), “somewhat relevant” (score 3), “relevant” (score 4), “highly relevant” (score 5). The participants received information on the relative frequency obtained in each category in the first round. However, since the data obtained in the first round were qualitative, we were unable to provide measures of central tendencies (e.g., mean) and levels of dispersion (e.g., standard deviation) of the data as feedback to participants. The group was also invited to provide further qualitative information if they felt that the ICF categories presented did not fully represent the health status of people with musculoskeletal conditions.

Delphi round III

ICF categories rated in the second Delphi round with a score equal to or higher than 3.5 out of 5 points were selected for the third round. The group was asked to classify these ICF categories as relevant or not relevant by responding to dichotomous questions (“yes” or “no”). The participants were given feedback regarding the score obtained by each category in the previous round. Similarly to the second round, since this score was obtained from ordinal data, no information was provided on the level of dispersion of the data.

Data analysis

Data were analyzed using Libreoffice Calc (version: 6.4.7.2. The Document Foundation. Debian and Ubuntu). Descriptive statistics were used to characterize the group of experts and to calculate frequencies and percentages of rated categories.

In the first Delphi round, a “meaning condensation” procedure was used for the qualitative analysis of data [43]. In a first step, the responses of the physiotherapists were read to obtain an overview of the collected data. In the second step, the data were divided into units of meaning

and the theme that dominated each meaning unit was determined. A meaning unit was defined as a specific unit of text either a few words or a few sentences with a common theme. In the third step, meaning units were coded into meaningful concepts and assigned to second-level ICF categories. If an answer contained more than one concept, several ICF categories could be linked. Answers related to personal factors were assigned the code "pf". In the event a meaningful concept could not be linked to an ICF category, it was coded as "nc" (not covered). Kappa coefficients and 95% confidence intervals (95% CI) were calculated to assess inter-rater reliability for the linking process. Relative and absolute frequencies were also computed from the identified ICF categories. Each category was counted only once for each expert to prevent overestimation.

The score of each category was calculated from the data obtained using the 5-points Likert scale in the second Delphi round. Analysis of the comments provided by participants was used as a measure of the degree of saturation of the data. The threshold of new information considered as evidence that saturation had been reached was set at 5% [44].

Finally, the percentage of agreement of the participants with respect to each category was calculated in the third round. The categories with a level of agreement equal to or higher than 75% were selected and compared with the categories included in the brief and comprehensive versions of the ICF core sets for musculoskeletal conditions, both acute and post-acute (available at: https://www.icf-core-sets.org/).

Ethical consideration

This study was approved by each Clinical Research Ethical Committee of the different health areas of "Castilla y León", Spain (reference code for Burgos-Soria area was CEIC 2231). The study was also registered in clinicaltrials.gov with identifier NCT04135976.

Results

Participants

A total of 144 physiotherapists from the eleven health areas were invited to participate in the study. Of those, 89 agreed to be recruited. Eighty-four physiotherapists met the inclusion criteria and completed the first Delphi round. The main demographic and professional characteristics of the participants from the first round are shown in table 2. Seventy-eight physiotherapists responded to the second round of the survey and 73 completed the third round. The completion rate across rounds was 86.9%.

[Table 2 near here]

Linking process

The Kappa coefficient for this process was .78 [95% CI: .68–.88]. In the first round, a total of 18 themes were identified from the responses of the physiotherapists and meaningful concepts were linked to 149 ICF categories (see supplemental material S1). In addition, a total of 7 concepts were classified as personal factors. Sixty categories and two personal factors were excluded because they did not achieve the cut-off point of 5 % in relative frequency (see supplemental material S2 for more details). Consequently, 89 ICF categories (59.7%) and 5 personal factors (71.4%) were presented to the participants in the second round.

Relevance of the identified ICF categories

In the second Delphi round, some participants provided additional qualitative data that were analyzed for missing ICF categories. The researchers did not identify new categories because the information was already contained in those previously presented, or referred to aspects outside the scope of the study (e.g. patient satisfaction or expectations about physiotherapy).

Regarding the assessment of the relevance of the ICF categories obtained in the first round, 50 categories (56.2%) and 5 personal factors (100%) scored 3.5 points or higher in the 5-point Likert scale. Since no missing categories were identified in this round, data saturation was considered to have been reached and only categories that had exceed the cut-off were submitted to the next round.

In the third round, 45 ICF categories (90%) and 5 personal factors (100%) reached consensus by obtaining a level of agreement equal to or higher than 75% (see table 3 for more details). These categories were distributed in the following ICF components: “body structures” (20%), “body functions” (40%) and “activities and participation” (40%). No consensus was reached for any category of the “environmental factors” component (see supplementary material S3 for further information on the categories that did not reach consensus).

[Table 3 near here]

Representativeness in the ICF core sets

The results of the study confirmed 15 out of the 27 categories (55.6%) in the brief ICF core set for acute musculoskeletal conditions [24], while 22 out of the 48 categories (45.8%) were confirmed in the comprehensive version. For the ICF core set for post-acute musculoskeletal conditions [25], 17 out of 31 categories (54.8%) were confirmed in the brief version and 35 out of 70 (50%) in the comprehensive version.

Regarding the representativeness of the physiotherapists' perspective in the comprehensive ICF core sets for musculoskeletal conditions, 22 of the categories (48.9%) identified in the survey were included in the ICF core set for acute conditions, while the ICF core set for post-acute conditions included 35 of these categories (77.8%). A more detailed comparison between the categories identified in the study and those present in the comprehensive ICF core set for post-acute musculoskeletal conditions showed that 6 categories from the “body structures” component could be confirmed (representing 85.7% of the total number of categories in this component), as well as 13 from “body functions” (56.5%) and 16 from “activities and participation” (72.7%). No category of the component “environmental factors” could be confirmed. Table 4 provides detailed information on the results of this comparison.

[Table 4 near here]

Discussion

The aim of this study was to identify the most relevant aspects considered by physiotherapists assessing patients with musculoskeletal conditions in a primary health care setting. When comparing the identified ICF categories with the existing core sets for musculoskeletal conditions, the comprehensive version for post-acute pathology has shown to be the most representative from the physiotherapists' perspective.

The results of this study are consistent with those observed in other validation studies for ICF core sets from the perspective of physiotherapists (e.g. low back pain, osteoarthritis, rheumatoid arthritis, stroke, etc.) [30,39,41,45,46]. Although the ICF core set for post-acute musculoskeletal conditions is able to represent most of the aspects considered important by physiotherapists, there are some issues that are not covered by this core set, while some of those included have not been considered relevant.

Frequently, ICF core set validations from the perspective of professionals are performed on specific diseases, without sufficient consideration of the clinical context. In the case of musculoskeletal conditions, the acute core set is intended for healthcare professionals not specialized in rehabilitation working in the acute hospital, while the post-acute core set is designed for multidisciplinary teams involved in early post-acute rehabilitation programs [47]. Since the rehabilitation process takes place along the continuum of care from the acute hospital to integration into the community, some authors have already expressed the need for an ICF core set covering specific aspects of chronic musculoskeletal disorders [26].

The physiotherapist's performance can be very different at each of these levels. In the acute hospital, health care is characterised as intensive, short-term and specialised. Medical management of the patient's condition is predominant and interventions to improve functioning are complementary. Therefore, the potential benefits of physiotherapy have to be weighed against the possible risks to the patient's medical condition [48]. In an early post-acute setting, improving functioning is the cornerstone of the patient's rehabilitation program and

physiotherapists are often part of multidisciplinary teams where they can rely on the ICF framework to share their understanding of functioning and to utilize standarized clinical assessment instruments [49]. The main gap in terms of ICF use is perhaps at the community level, where the physiotherapist can provide a patient-centered care that is more accessible and allows for long-term follow-up of the condition. Community physiotherapy interventions aim to promote health, prevent complications and minimize disability from a wide range of conditions [50,51]. Therefore, physiotherapy in primary health care has enormous potential in the management of musculoskeletal conditions and the role of the physiotherapist is becoming increasingly important in this clinical setting [4,10,52,53]. The results obtained in this study are relevant for making ICF operational in a context that deals with pathology of high prevalence, but very heterogeneous in terms of location, etiology and clinical stage.

The findings of this study reinforce the notion that movement is the core expertise of physiotherapy, which is consistent with what has been stated by other authors [54-56] and confirmed in a previous Delphi study on the identification of relevant ICF categories in physiotherapy [57]. With respect to the “body structures” component of the ICF, eight of the nine categories that reached consensus belonged to the chapter “s7 structures related to movement”. Likewise, when considering the “body functions” component, most of the categories (61%) belonged to chapter “b7 neuromusculoskeletal and movement-related functions”. Some categories from other chapters that are indirectly related to the movement system were also considered, such as tactile and proprioceptive functions (“b2 sensory functions and pain”) and those related to the cardiovascular system (“b4 functions of the cardiovascular, haematological, immunological and respiratory system”). Pain was also considered as a crucial element in this type of conditions by physiotherapists, as shown by the 100% consensus obtained in this survey. Some studies have already pointed out the relationship between pain, alterations in patient behavior (e.g., kinesiophobia, fear-avoidance beliefs, etc.)

and disability for some musculoskeletal conditions (e.g., low back pain) [58-61]. The relationship between pain, movement patterns and musculoskeletal injury has also been reported in several studies [62-64].

Regarding the “activities and participation” component, the consensus was reached for ten categories from chapter “d4 mobility”, seven from “d5 self-care” and one from “d9 community, social and civic life”. The dimensions considered were again related to movement and the impact that its restriction has on a person's life. These findings are consistent with items present in assessment scales used for major musculoskeletal conditions (e.g., the Roland Morris Questionnaire for Low Back Pain, the Neck Disability Index or the Shoulder Pain and Disability Index) [65-67]. The importance attributed to “d450 walking” (98.6% agreement) is noteworthy, due to its relevance as a predictor of disability and quality of life [68-70].

In addition, the following “personal factors” were identified: age, presence of comorbidities, coping strategies, willingness to collaborate in physiotherapy treatment and previous knowledge and beliefs about pain. When considering these personal factors, it is observed that some of them have to do with the patient's state of health and others are related to psychological aspects that may influence the physiotherapy treatment. Budtz et al. [71] have found similar results in a study about predictors of healthcare utilization among patients with musculoskeletal disorders. Thus, physiotherapists seem to value individualized care, based on the patient's functional profile, as well as identifying the therapist-patient relationship as very relevant to achieve the therapeutic goals. Furthermore, it shows that the work of the physiotherapist should not only focus on the application of physical agents, but also these health interventions based on education can also have an important impact on health outcomes. In addition, these findings may contribute to the attempts made by other authors to classify personal factors in the ICF framework [72,73].

However, a relevant finding of this study is that no consensus has been reached for any category belonging to the component “environmental factors”. The importance of these factors is at the conceptual basis of the ICF [74], although some authors have stated that the current coding system is inadequate to identify and measure these factors [75]. Finger et al. [57] attempted to overcome these disadvantages by using an approach that considered a mutually influential relationship between environmental factors and physiotherapy interventions. Their findings highlight the difficulties in reaching a consensus on environmental factors on these practitioners and suggest that further studies are needed. Considering the results of our study, the heterogeneity of physiotherapy units in primary care is a possible explanation for the lack of consensus, due to marked contrasts between urban and rural areas. Some studies have described differences in the access to the healthcare system and in the management of some diseases, depending on the place of residence [76,77]. Therefore, the impact of the environment on people's functioning can be highly variable and thus make it difficult to establish a consensus. Another possible explanation is that physiotherapists are not aware of the importance of these factors and did not consider these categories to be relevant in their clinical practice. As some authors have pointed out, knowledge and awareness of these factors may influence treatment outcomes [78].

Some of the categories that reached consensus in the survey were not included in the ICF core set. Most of them covered aspects related to the movement described above, either directly (e.g., “s770 additional musculoskeletal structures related to movement” or “b720 mobility of bone functions”) or indirectly (e.g., “b265 touch function” or “b460 sensations associated with cardiovascular and respiratory functions”). This finding suggests that physiotherapists need greater specificity in the assessment of these issues and reaffirms the concept of movement as the core expertise of physiotherapy.

There were also some categories from the core set that could not be confirmed by the survey. Since no environmental factor reached consensus in the survey, most of the unconfirmed categories (51.4%) belonged to this component. The remaining categories describe more general body functions (e.g. “b130 energy and drive functions” or “b152 emotional functions”) that were not considered sufficiently relevant.

In order to develop a tailored ICF core set for physiotherapists working in primary care, these issues need to be addressed to fully represent their perspective. As Sahrmann [79] stated, diagnostic labels are key to understanding the dysfunction causing the patient's functional problem. Physiotherapists, as movement experts, need to understand that these labels have to be different from those used by physicians. For this reason, a careful selection of ICF categories has deep implications, not only for the development of diagnosis in physiotherapy, but for shaping how the physiotherapists perceive themselves and are considered by other healthcare professionals and society. The findings observed in this study are a step in this direction and contribute to clarify these issues.

The main limitation of this study is the lack of consensus on environmental factors, possibly as a consequence of our study design. The information obtained in the first Delphi round allowed us to identify 19 ICF categories related to this ICF component, although they could not be confirmed in the second round. As observed by Finger et al. [57], physiotherapy interventions influence or are influenced by a broad spectrum of environmental factors, but very few of them can be considered universally applicable to this profession. The authors hypothesize that physiotherapists with experience in various clinical settings tend to relativize the importance of these factors and, paradoxically, have greater difficulty judging their relevance. Responses to the Likert scale supported this assumption, as physiotherapists with experience in both settings tended to assign average scores to ICF categories related to environmental factors. Therefore, these ICF categories did not exceed the established cut-off and were discarded in the second

Delphi round. The use of dichotomous questions instead of a Likert scale could have allowed confirmation of some of them, as was achieved in the above-mentioned study [57].

According to the findings of our study, ICF categories with a level of agreement equal to or higher than 60% in the second Delphi round (3 or more points out of 5 on the Likert scale) have a good potential to describe environmental factors and can be proposed as a recommendation: *e115 – Products and technology for personal use in daily living, e120 – Products and technology for personal indoor and outdoor mobility and transportation, e125 – Products and technology for communication, e135 – Products and technology for employment, e310 – Immediate family, e450 – Individual attitudes of health professionals* and *e580 – Health services, systems and policies*. However, more studies are needed to further explore these contextual areas of functioning from the perspective of primary care physiotherapists.

Another limitation is the risk of bias in the sample due to the small size of the study population and the recruitment strategy applied. In addition, the inclusion of physiotherapists from both urban and rural areas could also be considered as a possible bias in the sample. A large proportion of the target population (61.8%) could be recruited and most of the participants (71.4%) had experience in both settings, so a sufficient degree of validity in the results can be expected. Finally, physiotherapy services in primary care are not well defined and may differ greatly between countries and regions. Therefore, the results cannot be generalized to all physiotherapists practicing in primary care because participants in this study belonged to a single care setting with very specific characteristics. However, these data could be pooled with those obtained in similar studies to generalize conclusions.

Conclusion

This study has obtained the information necessary to develop a tailored ICF core set for physiotherapists in primary care. The comprehensive ICF core set for post-acute musculoskeletal conditions can be used as a starting point for operationalizing the ICF in this

clinical setting. However, some adjustments are necessary to ensure that the physiotherapist's perspective is fully represented.

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Table 1. Questions and ICF components covered in Delphi round one

Question	ICF component
If you think about the body and mind of a person with a musculoskeletal condition that you're going to assess... what problems are relevant to him/her?	Body functions
If you think about the body of the person with with a musculoskeletal condition that you're going to assess... in which parts are his/her problems?	Body structures

If you think about the daily life of the person with with a musculoskeletal condition that you're going to assess… what are his/her problems?	Activities and participation
If you think about the environment and the living conditions of the person with a musculoskeletal condition that you're going to assess. what is supportive for him/her?	Environmental factors (facilitator)
If you think about the environment and the living conditions of the person with a musculoskeletal condition that you're going to assess. what is hindering for him/her?	Environmental factors (barrier)
If you think about the person with a musculoskeletal condition that you're going to assess. what is important about him/her and the way he/she handles his/her condition?	Personal factors

ICF: International Classification of Functioning, Disability and Health

Table 2. Demographic and professional characteristics of participants in the first round and participation rate across the three Delphi rounds

Variable	**Description**
Participation rate *n*[a] *(%)*	
Round 1	84 (94.4)
Round 2	78 (92.9)

Round 3	73 (93.5)
Age *mean (SD[b])*	43.1 (6.3)
Gender *n (%)*	
Male	16 (19.0)
Female	68 (81.0)
Educational level *n (%)*	
Degree	57 (67.9)
Expert	15 (17.9)
Master's Degree	9 (10.7)
PhD	3 (3.6)
Years of experience in primary health care *n (%)*	
< 2 years	5 (5.6)
2-5 years	16 (18.0)
> 5 years	68 (76.4)
Experience related to place of residence of population treated *n (%)*	
Urban	10 (11.9)
Rural	14 (16.7)
Both	60 (71.4)

[a]Sample size

[b]Standard deviation

Table 3. Descriptive statistics of consensus ratings across the 3 phases of the Delphi process

ICF Component	Chapter	ICF code	ICF Category	Round 1	Round 2	Round 3	Consensus achieved (round)
				Relative frequency (%)	Score	Level of agreement (%)	
Body structures	Structures of the nervous system	s120	Spinal cord and related structures	11.9	3.8	97.3	2
	Structures related to movement	s710	Structure of head and neck region	60.7	3.5	100	3
		s720	Structure of shoulder region	57.1	4.6	98.6	2

		s730	Structure of upper extremity	35.7	4.6	100	2
		s740	Structure of pelvic region	13.1	4.7	98.6	2
		s750	Structure of lower extremity	51.1	4.6	98.6	2
		s760	Structure of trunk	61.9	4.6	98.6	2
		s770	Additional musculoskeletal structures related to movement	54.8	4.7	97.3	2
		s799	Structures related to movement, unspecified	14.3	4.7	90.4	2
Body functions	Sensory functions and pain	b260	Proprioceptive function	10.7	4.8	98.6	2
		b265	Touch function	9.5	3.9	80.8	2
		b270	Sensory functions related to temperature and other stimuli	9.5	3.7	84.9	2
		b280	Sensation of pain	11.9	4.7	100	2
	Functions of the cardiovascular, haematological, immunological and respiratory system	b445	Respiratory muscle functions	9.5	3.9	84.9	2
		b455	Exercise tolerance functions	10.7	4.4	97.3	2
		b460	Sensations associated with cardiovascular and respiratory functions	10.7	3.7	79.5	3
	Neuro-musculoskeletal and movement-related functions	b710	Mobility of joint functions	67.9	4.8	100	2
		b715	Stability of joint functions	11.9	4.7	97.3	2
		b720	Mobility of bone functions	54.8	4.8	98.6	2
		b730	Muscle power functions	46.4	4.7	100	2
		b735	Muscle tone functions	16.7	4.6	98.6	2
		b740	Muscle endurance functions	10.7	4.5	100	2
		b750	Motor reflex functions	5.9	4.1	90.4	2
		b755	Involuntary movement reaction functions	34.5	4.3	84.9	2
		b760	Control of voluntary movement functions	29.8	4.6	98.6	2
		b770	Gait pattern functions	44.0	4.7	100	2
		b780	Sensations related to muscles and movement functions	8.3	4.3	97.3	2

ICF: International Classification of Functioning, Disability and Health

Table 3 (continued). Descriptive statistics of consensus ratings across the 3 phases of the Delphi process

ICF Component	Chapter	ICF code	ICF Category	Round 1	Round 2	Round 3	Consensus achieved (round)
				Relative frequency (%)	Score	Level of agreement (%)	
Activities and participation	Mobility	d410	Changing basic body position	25	4.4	97.3	2
		d415	Maintaining a body position	27.4	4.4	95.9	2
		d420	Transferring oneself	26.2	4.5	94.5	2

		d430	Lifting and carrying objects	27.4	4.3	93.2	2
		d435	Moving objects with lower extremities	17.9	4.3	93.2	2
		d440	Fine hand use	29.8	4.6	97.3	2
		d445	Hand and arm use	16.7	4.6	97.3	2
		d450	Walking	57.1	4.8	98.6	2
		d460	Moving around in different locations	34.5	4.8	94.5	2
		d465	Moving around using equipment	14.0	3.8	78.1	2
	Self-care	d510	Washing oneself	48.8	4.2	91.2	2
		d520	Caring for body parts	46.4	4.1	87.7	2
		d530	Toileting	47.6	4.0	82.2	2
		d540	Dressing	41.7	4.3	95.9	2
		d550	Eating	32.1	4.2	90.4	2
		d560	Drinking	23.8	4.2	90.4	2
		d570	Looking after one's health	52.4	4.2	94.5	2
	Community, social and civic life	d920	Recreation and leisure	65	3.8	83.6	2
Personal factors	Age			13.1	4.9	97.3	2
	Attitude to cope with the musculoskeletal condition			58.3	4.7	100	2
	Willingness to cooperate in physiotherapy treatment			57.1	4.8	100	2
	Previous knowledge and beliefs regarding pain			56.0	3.9	86.3	2
	Presence of comorbidities			6.0	4.3	98.6	2

ICF: International Classification of Functioning, Disability and Health

Table 4. Summary of ICF categories for which consensus among physiotherapists was reached and comparison with the categories included in the Comprehensive ICF Core Set for post-acute Musculoskeletal Conditions.

	ICF component	ICF category	Percentage of agreement (%)
Categories for which consensus was reached but which do not feature in the Comprehensive ICF core set	Body structures	s120 Spinal cord and related structures	97.3
		s770 Additional musculoskeletal structures related to movement	97.3
		s799 Structures related to movement, unspecified	90.4
	Body functions	b265 Touch function	80.8
		b445 Respiratory muscle functions	84.9

		b460 Sensations associated with cardiovascular and respiratory functions	79.5
		b720 Mobility of bone functions	98.6
		b750 Motor reflex functions	90.4
	Activities and participation	d435 Moving objects with lower extremities	93.2
		d920 Recreation and leisure	83.6
Categories from the Comprehensive ICF core set for which consensus was not reached	Body structures	s810 Structure of areas of skin	a
	Body functions	b130 Energy and drive functions	b
		b134 Sleep functions	b
		b152 Emotional functions	b
		b415 Blood vessel functions	a
		b435 Immunological system functions	a
		b440 Respiration functions	65.8
		b525 Defecation functions	b
		b530 Weight maintenance functions	a
		b620 Urination functions	b
		b810 Protective functions of the skin	a
	Activities and participation	d155 Acquiring skills	b
		d177 Making decisions	a
		d230 Carrying out daily routine	a
		d240 Handling stress and other psychological demands	b
		d310 Communicating with - receiving - spoken messages	b
		d760 Family relationships	c

[a] Not identified in the first Delphi round.

[b] Does not exceed the cut-off point in the first Delphi round (relative frequency below 5%).

[c] Does not exceed the cut-off point in the second Delphi round (score below 3.5 points).

ICF: Classification of Functioning, Disability and Health

Table 4 (continued). Summary of ICF categories for which consensus among physiotherapists was reached and comparison with the categories included in the Comprehensive ICF Core Set for post-acute Musculoskeletal Conditions.

	ICF component	**ICF category**	**Percentage of agreement (%)**
Categories from the Comprehensive ICF core set for which consensus was not reached	Environmental factors	e110 Products or substances for personal consumption	b
		e115 Products and technology for personal use in daily living	c
		e120 Products and technology for personal indoor and outdoor mobility and transportation	c

(continued)

e125 Products and technology for communication	c
e150 Design, construction and building products and technology of buildings for public use	c
e225 Climate	a
e310 Immediate family	c
e320 Friends	c
e340 Personal care providers and personal assistants	b
e355 Health professionals	b
e410 Individual attitudes of immediate family members	c
e420 Individual attitudes of friends	c
e430 Individual attitudes of people in positions of authority	c
e440 Individual attitudes of personal care providers and personal assistants	a
e450 Individual attitudes of health professionals	c
e555 Associations and organizational services	c
e575 General social support services	c
e580 Health services	c

[a] Not identified in the first Delphi round.

[b] Does not exceed the cut-off point in the first Delphi round (relative frequency below 5%).

[c] Does not exceed the cut-off point in the second Delphi round (score below 3.5 points).

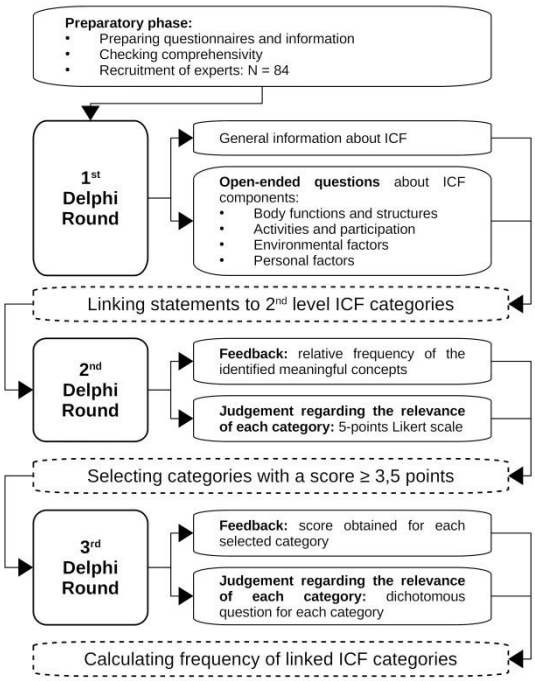

Figure 1. Flowchart to illustrate the stages of the Delphi process. ICF: International Classification of Functioning, Disability and Health

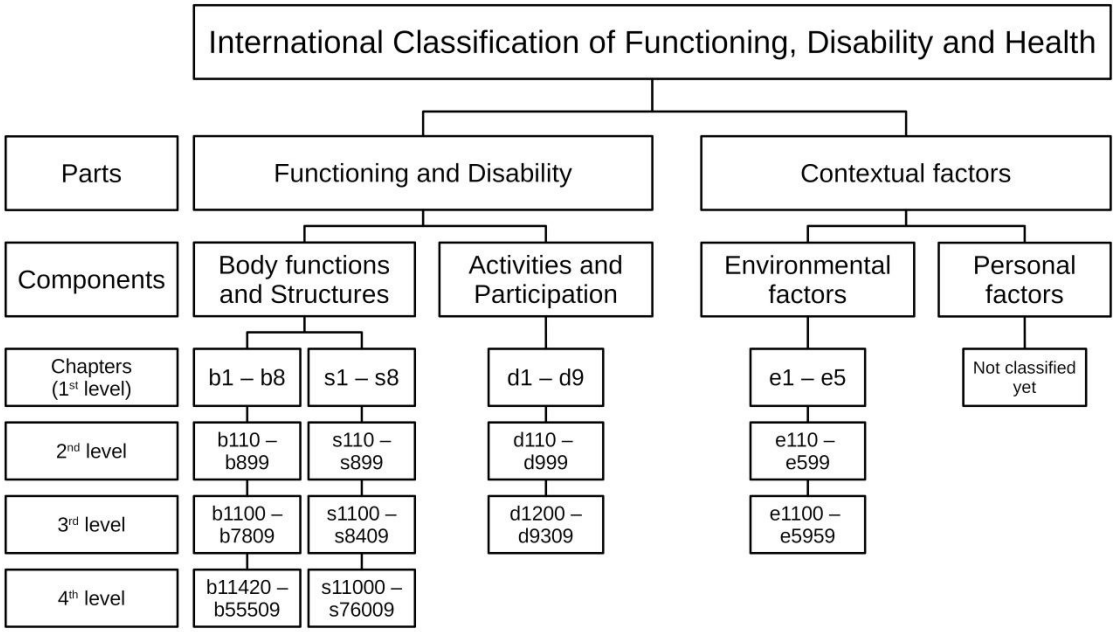

Figure 2. The hierarchic structure of the International Classification of Functioning, Disability and Health (ICF)

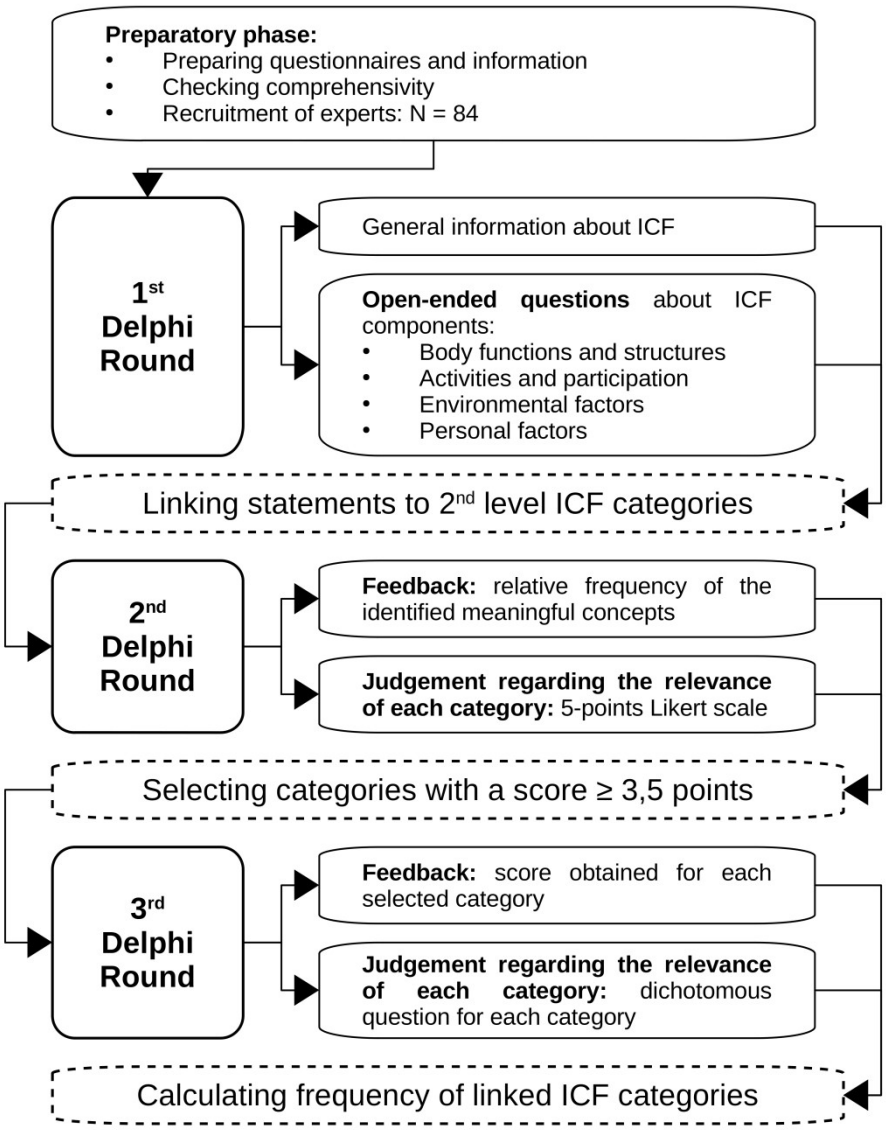

Figure 1 Caption. Flowchart to illustrate the stages of the Delphi process.

Figure 1 Alt Text. The preparatory phase and the 3 rounds conducted in the study are presented from the top to the bottom in the flowchart. For each round, information on the feedback, objective and tasks performed is provided.

79x91mm (1200 x 1200 DPI)

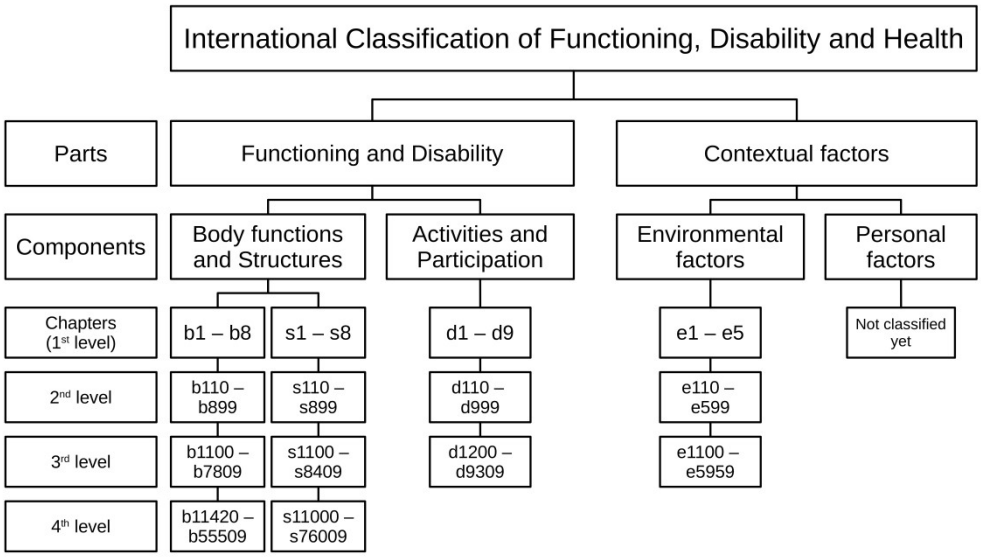

Figure 2 Caption. The hierarchic structure of the International Classification of Functioning, Disability and Health (ICF).

Figure 2 Alt Text. The upper part of a tree diagram shows the conceptual division of the ICF into parts and components. Further divisions at the bottom show the types of ICF categories according to their level of detail.

150x88mm (1200 x 1200 DPI)

Supplemental material

S1. Themes identified after the qualitative analysis of the information obtained in the first Delphi round. The main ICF component and the number of ICF categories related to each theme is specified.

Theme	ICF component	Number of ICF categories related
Problems in structures directly related to movement	Body structures	8
Problems in structures indirectly related to movement	Body structures	16
Skin alterations	Body structures	1
Impairments in movement-related functions of the musculoskeletal system	Body functions	13
Impairments in exercise-related cardiovascular and respiratory functions	Body functions	8
Presence of pain or deficits in sensory functions related to movement	Body functions	8
Impairments in mental and cognitive functions	Body functions	12
Limitations in walking and general mobility	Activities and participation	13
Difficulty in performing basic and instrumental activities of daily living	Activities and participation	12
Limitations in communication and personal skills	Activities and participation	4
Difficulty in establishing or maintaining interpersonal relationships	Activities and participation	5
Impact on participation in society	Activities and participation	7
Ability of acquiring and using assistive products or other goods.	Environmental factors	8
Characteristics of the physical environment and accessibility	Environmental factors	7
Availability of public or private services to meet the population's needs	Environmental factors	14
Presence or absence of supportive relationships	Environmental factors	13
Personal features	Personal factors	4[a]
Personal ideas, beliefs, knowledge and attitudes	Personal factors	3[a]

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[a] Not corresponding to ICF categories

S2. ICF categories with a level of agreement below 5% after the first Delphi round. Fifty-six ICF categories (37.6%) and one personal factor (14.3%) did not exceed the established cut-off and were discarded in this round.

ICF code	Body Structures	Percentage of Agreement
s140	Structure of sympathetic nervous system	1.2
s150	Structure of parasympathetic nervous system	1.2
s230	Structures around eye	1.2
s260	Structure of inner ear	1.2
s410	Structure of cardiovascular system	3.6
s430	Structure of respiratory system	4.8
s499	Structures of the cardiovascular, immunological and respiratory systems, unspecified	3.6
s540	Structure of intestine	1.2
s560	Structure of liver	1.2
s580	Structure of endocrine glands	1.2
s599	Structures related to the digestive, metabolic and endocrine systems, unspecified	2.4
s620	Structure of pelvic floor	2.4
s699	Structures related to the genitourinary and reproductive systems, unspecified	2.4
ICF code	**Body Functions**	**Percentage of Agreement**
b114	Orientation functions	1.2
b117	Intellectual functions	1.2
b130	Energy and drive functions	1.2
b134	Sleep functions	4.8
b140	Attention functions	2.4
b144	Memory functions	2.4
b147	Psychomotor functions	2.4
b152	Emotional functions	1.2
b160	Thought functions	1.2
b164	Higher-level cognitive functions	3.6
b167	Mental functions of language	1.2
b210	Seeing functions	3.6
b230	Hearing functions	3.6
b235	Vestibular functions	1.2
b298	Sensory functions and pain, other specified: neurophatic pain	1.2
b429	Functions of the cardiovascular system, other specified and unspecified	2.4
b525	Defecation functions	1.2
b599	Functions of the digestive, metabolic and endocrine systems, unspecified	1.2
b620	Urination functions	1.2
b798	Neuromusculoskeletal and movement-related functions, other specified: compensatory movements	1.2

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S2 (continued). ICF categories with a level of agreement below 5% after the first Delphi round. Fifty-six ICF categories (37.6%) and one personal factor (14.3%) did not exceed the established cut-off and were discarded in this round.

ICF code	Activities and Participation	Percentage of Agreement
d155	Acquiring skills	1.2
d166	Reading	4.8
d240	Handling stress and other psychological demands	2.4
d310	Communicating with - receiving - spoken messages	2.4
d449	Carrying, moving and handling objects, other specified and unspecified	1.2
d475	Driving	4.8
d650	Caring for household objects	1.2
d710	Basic interpersonal interactions	2.4
d720	Complex interpersonal interactions	2.4
d799	Interpersonal interactions and relationships, unspecified	1.2
d810	Informal education	1.2
d839	Education unspecified	3.6
d910	Community life	3.6
d930	Religion and spirituality	1.2
ICF code	**Environmental Factors**	**Percentage of Agreement**
e110	Products or substances for personal consumption	2.4
e235	Human-caused events	2.4
e299	Natural environment and human-made changes to environment, unspecified	2.4
e340	Personal care providers and personal assistants	4.8
e345	Strangers	1.2
e355	Health professionals	2.4
e445	Individual attitudes of strangers	3.6
e499	Attitudes, unspecified	2.4
e525	Housing services, systems and policies	1.2
e565	Economic services, systems and policies	4.8
e570	Social security services, systems and policies	2.4
e585	Education and training services, systems and policies	3.6
e599	Services, systems and policies, unspecified	4.8
ICF code	**Personal Factors**	**Percentage of Agreement**
NA	Cultural factors	3.6
NA	Sex	4.8

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NA: not applicable

S3. Scores and level of agreement obtained by the ICF categories discarded in the second and third Delphi rounds. The results are shown grouping the categories according to the ICF component to which they belong. Categories that did not exceed the cut-off point of the second round (score equal to or higher than 3.5 points) are presented in italics.

ICF code	Body Structures	Delphi round 2 (score)	Delphi round 3 (% of agreement)
s110	*Structure of brain*	*3.2*	-
s199	*Structure of the nervous system, unspecified*	*3.4*	-
s899	Skin and related structures, unspecified	4.4	72.6

ICF code	Body Functions	Delphi round 2 (score)	Delphi round 3 (% of agreement)
b126	*Temperament and personality functions*	*3.4*	-
b440	Respiration functions	3.6	65.8
b765	Involuntary movement functions	4.0	72.6

ICF code	Activities and Participation	Delphi round 2 (score)	Delphi round 3 (% of agreement)
d455	Moving around	4.1	74.0
d620	*Acquisition of goods and services*	*2.9*	-
d630	*Preparing meals*	*3.1*	-
d640	*Doing housework*	*3.3*	-
d660	*Assisting others*	*2.8*	-
d750	*Informal social relationships*	*2.9*	-
d760	*Family relationships*	*2.7*	-
d850	Remunerative employment	3.8	61.6
d870	*Economic self-sufficiency*	*3.0*	-

ICF code	Environmental factors	Delphi round 2 (score)	Delphi round 3 (% of agreement)
e115	*Products and technology for personal use in daily living*	*3.0*	-
e120	*Products and technology for personal indoor and outdoor mobility and transportation*	*3.3*	-
e125	*Products and technology for communication*	*3.0*	-
e130	*Products and technology for education*	*2.8*	-
e135	*Products and technology for employment*	*3.2*	-
e140	*Products and technology for culture, recreation and sport*	*2.9*	-

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S3. Scores and level of agreement obtained by the ICF categories discarded in the second and third Delphi rounds. The results are shown grouping the categories according to the ICF component to which they belong. Categories that did not exceed the cut-off point of the second round (score equal to or higher than 3.5 points) are presented in italics.

ICF code	Environmental factors (continued)	Delphi round 2 (score)	Delphi round 3 (% of agreement)
e150	*Design, construction and building products and technology of buildings for public use*	*2.6*	-
e155	*Design, construction and building products and technology of buildings for private use*	*2.6*	-
e160	*Products and technology of land development*	*2.1*	-
e165	*Assets*	*2.2*	-
e210	*Physical geography*	*1.9*	-
e260	*Air quality*	*2.4*	-
e310	*Immediate family*	*3.1*	-
e315	*Extended family*	*2.6*	-
e320	*Friends*	*2.8*	-
e325	*Acquaintances, peers, colleagues, neighbours and community members*	*2.5*	-
e410	*Individual attitudes of immediate family members*	*2.9*	-
e415	*Individual attitudes of extended family members*	*2.4*	-
e420	*Individual attitudes of friends*	*2.4*	-
e425	*Individual attitudes of acquaintances, peers, colleagues, neighbours and community members*	*2.2*	-
e430	*Individual attitudes of people in positions of authority*	*2.3*	-
e450	*Individual attitudes of health professionals*	*3.0*	-
e460	*Societal attitudes*	*2.5*	-
e520	*Open space planning services, systems and policies*	*2.4*	-
e540	*Transportation services, systems and policies*	*2.8*	-
e555	*Associations and organizational services, systems and policies*	*2.5*	-
e575	*General social support services, systems and policies*	*2.8*	-
e580	*Health services, systems and policies*	*3.3*	-
e590	*Labour and employment services, systems and policies*	*2.5*	-

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