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# Operationalization of the International Classification of Functioning, Disability and Health, ICF, in a Specialized Rehabilitation Center

## *Operacionalização da Classificação Internacional de Funcionalidade, Incapacidade e Saúde, CIF, em um Centro Especializado em Reabilitação*

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### ABSTRACT

**Purpose:** Describe the implementation process of the International Classification of Functioning, Disability and Health (ICF) in a Specialized Rehabilitation Center based on the biopsychosocial approach to health. **Methods:** This is a descriptive, analytical, longitudinal study. The ICF implementation process in the healthcare center encompassed four stages: a) training on the use of the ICF; b) preparation of checklists by the team; c) collection of relevant data based on the checklist from the healthcare center users; and d) construction of a database. **Results:** A checklist was constructed for each sector involved, and the database included user information and the ICF results during evaluation and reevaluation. The findings indicate higher problem-solving capacity in all sectors throughout the study period, and that training was crucial to operationalize the ICF. Preparation of the instruments based on the reality of the healthcare center was essential to meet local demands and those of each sector. **Conclusion:** The ICF enabled greater practice of the biopsychosocial approach based on the engagement of the professionals in its operationalization, with evidence of healthcare problem-solving capacity and visibility and organization of the work process.

### RESUMO

**Objetivo:** Interessar descrever o processo de implementação da Classificação Internacional de Funcionalidade, Incapacidade e Saúde (CIF) em um Centro Especializado em Reabilitação fundamentado na abordagem biopsicossocial de saúde. **Método:** Trata-se de pesquisa-ação, descritiva, analítica e longitudinal. O processo de implementação no serviço abrangeu quatro etapas: a) Capacitação para uso da CIF; b) Construção de *checklists* pela equipe; c) Aplicação dos *checklists* com usuários do serviço; e d) Construção de banco de dados. Foi elaborado um *checklist* para cada setor envolvido e um banco de dados incluindo informações do resultado da avaliação e reavaliação dos usuários. **Resultados:** Os achados indicam maior resolutividade em todos os setores no período estudado e que a capacitação foi fundamental para operacionalização da CIF. A construção de instrumentos com base na realidade do serviço foi essencial para atender às demandas locais e de cada setor. **Conclusão:** A CIF possibilitou maior prática da abordagem biopsicossocial a partir do envolvimento dos profissionais na sua operacionalização, com evidências de resolutividade do serviço, além de visibilidade e organização do processo de trabalho.

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## INTRODUCTION

There are still few attempts to systematize and incorporate the ICF in the routine of healthcare centers, although the National Health Council has already regulated this Classification through its Resolution 452/12. It is also part of the checklist for the evaluation performed in Specialized Rehabilitation Centers (CER, in the acronym in Portuguese) of the National Healthcare Services Program (PNASS, in the acronym in Portuguese). Furthermore, this classification model is reference for the Brazilian Law for the Inclusion of Disabled People, n°. 13146/2015, which stipulates that the evaluation of the disability, when needed, will have a biopsychological approach<sup>(1-4)</sup>.

The International Classification of Functioning, Disability and Health (ICF) provides the most appropriate system to describe the healthcare, and can be used as a reference tool in orientating healthcare services, allowing the unification of the language used by different professionals of multi-professional teams, and specially to incorporate the Biopsychosocial model into the medical intervention planning. This would allow an important change of paradigm in the existent healthcare model, from a biomedical perspective to a biopsychosocial perspective. The incorporation of the ICF in healthcare services is justified for allowing to obtain more knowledge about users' health conditions, to longitudinally monitor their recuperation, accepting their needs and contributing to their healthcare improvement<sup>(5-11)</sup>.

To that end, the use of this Classification in healthcare services demands the development of appropriate tools for its implementation in the clinical-therapeutic practice. Tools comprising the core ICF sets, in combination with the use of qualifiers brought by the classification, allow the description of user's functionality experience, to define therapeutic goals and appropriate interventions, allowing an overlook of the resources needed to improve specific functionality aspects, as well as to monitor post-assistance changes<sup>(12-16)</sup>.

Because of the ICF complexity and of the large number of aspects considered, the World Health Organization (WHO) has proposed ICF core sets, category sets that describe the functionality of people with given health conditions. Instead of evaluating 1,454 aspects of people's functionality, only those categories that are typical and significant for a given disease should be evaluated<sup>(17)</sup>. However, ICF core sets do not comprise the description of functionality of people with more than one health condition, as usually found in people assisted in healthcare services, especially the elderly, because those sets are structured to obtain a specific set of disease-related categories. Therefore, the use of core sets also allows to conceiving a healthcare attention based on the disease, thus reinforcing the biomedical model instead of the biopsychosocial approach, as proposed by the ICF. In 2012, the Collaborating Centre for the Family of International Classifications, in Germany, introduced the ICF Core Sets in the clinical practice, and is one of the references for this study<sup>(18)</sup>. However, in this study, we have decided to create new instruments – checklists – fit to the local demands of the studied healthcare center. With that, the idea is to define the relations between the conducted evaluations and their measurement, the provided healthcare, the healthcare service assignments, and the domains of ICF and its qualifiers<sup>(19)</sup>.

In Brazil, there are successful experiences of this kind, such as the Evaluation for Granting the Continuous Benefit for Disabled Person, BPC (in Portuguese), which has instruments that use the ICF and the Brazilian functionality Index (IFBr, in Portuguese), for the purposes of granting retirement pensions to disable people. Such instruments were created based on the needs of the work process<sup>(20,21)</sup>.

In view of the aforementioned, this study proposes to describe the ICF operationalization process by means of the construction of instruments, such as checklists, based on the local needs and on the users' demands, taking into consideration the work routine and process of a specialized rehabilitation center. Therefore, the step-by-step process of ICF operationalization in this center is described, in order to contribute to the thought of ways to incorporate the ICF in the assistance routine of other healthcare centers.

## METHODS

This is research-action of descriptive, analytic, longitudinal nature design, with the aim of describing the process of providing the multidisciplinary team with instruments to use the ICF, as part of the process of implementation of the Classification in the routine of a Specialized Rehabilitation Center, in a medium scale city of State of São Paulo. The research was approved by the Research Ethics Committee of the University where the study was conducted, under CAAE no. 69670917.7.0000.5404, under the terms of Resolution 466/12 of CONEP, as well as by the Ethics Committee of the Municipal Health department to which the service belongs. The Coordination of Human Resources Formation and Management of such local government also provided an opinion expert report on the research. All participants have signed the Free, Prior and Informed Consent, after the research explanation and their consent, authorizing the use of the data collected in the study.

The special rehabilitation center where the research was conducted comprises a multidisciplinary team composed of 26 professionals from the fields of Physical Therapy, Occupational Therapy, Psychology, Speech and Language Therapy, and Social Work. It belongs to the Single Health System – SUS (acronym in Portuguese) –, directly administrated by the federal government. This center provides healthcare to adult users with neurological disorders, in the modalities of homecare and outpatient care; disorders of musculoskeletal origin characterized by Repetitive Strain Injury (RSI) and Work Related Diseases (WRD) are addressed in the outpatient care modality, as well as the assistance to school age children with learning disorders. Among the assisted users, 65 took part of the research, and all of them were already patients of the center. The demand was intentional and chosen by the professionals responsible for the healthcare service, with no distinction between recently admitted users and older users. Professionals were asked by the immediate chief to participate in the study, but they could also choose to not participate in the process of the Classification implementation.

ICF implementation process in the center occurred in four steps:

- Step 1: Training for the use of the ICF, with the following programmatic content: concepts, structure, manners to apply

and use the ICF. Workload of 12 hours, with theoretical and practical components;

- Step 2: Construction of checklists in which there was an attempt to relate the main issues, results and/or clinical measures of each sector to the key ICF components and categories;
- Step 3: Use of specific checklists per sector in the initial evaluation and reevaluation, according to the phases of the Rehabilitation cycle proposed by Rauch et al.<sup>(22)</sup>;
- Step 4: Creation of a databank, including information about users' evaluation and reevaluation results.

As stipulated by the World Health Organization, for the use of ICF, information can be collected by means of the observation done by an experienced professional, and organized into the ICF model. The clinical judgment or professional reasoning is used to identify the target-category and to define the degree of disease seriousness<sup>(9,10)</sup>.

In the process of constructing checklists, there was an attempt to relate the main aspects, results and/or clinical measures of each area to the more precise ICF categories, establishing the correspondence between the items of evaluation of each sector and ICF components. Therefore, service professionals, participants of the study, developed checklists firstly based on the correspondence between the clinical evaluation performed by each specialist and the ICF, also based on connection rules proposed by Cieza et al.<sup>(14)</sup>, which allow to relating and comparing significant concepts and contents contained in the professional routine. Such correspondence between the aspects evaluated by the healthcare professionals and the ICF was established based on their accumulated experience and on the knowledge about the ICF they obtained in the training. As orientating base, Annex 9 of ICF was also used, comprising the items suggested as minimum and ideal for health information systems or for health surveys, or for researches, with the use of data from this classification and Core Sets for the clinical practice<sup>(9,10)</sup>.

For the construction of the checklist per sector, three orientating issues were introduced to subsidize professionals to relate the evaluation data used in the healthcare routine to the ICF codes, considering that, during the team training, ICF concepts and structures needed for this process were addressed. The issues presented as follows aimed to support the group to orientate the choice of ICF categories, contributing to participants being to define a better correspondence between their clinical evaluations and the ICF, and thus ensuring that the necessary components were included.

Orientating issues:

1. Which ICF domains compose my daily routine?
2. What kind of information I obtain from the evaluation I do in terms of function (b), structure (s), activity and participation (d)?
3. Which environmental factors (e) – access to equipment, medicines, prostheses, family members, caretakers, work, employment, social life, etc. - affect my practice?

After the training for the ICF use, the team was split into four subgroups per sectors defined by the participants: Homecare,

Musculoskeletal Care, Multidisciplinary Team in Neurology, and Children's Speech and Language Therapy. Specific instruments were constructed – checklists – considering the following: clinical profile of the assisted population, level of healthcare complexity, type of healthcare, and professional routine. The checklists selection process, whether per specialty or multi-professional, was agreed on by the team. The criterion was to evaluate users who were assisted by more than one specialist.

For the construction of checklists, ICF components and its alphanumeric system were taken into consideration, where the first classification level is coded with a letter referring to a component. Letter (b) refers to body functions, letter (s) to body structures, letter (d) to activities and participation, and letter (e) to environmental factors. There was a concern to restrict it to the smallest possible number of ICF categories, though enough to describe the needs of provided healthcare information and the spectrum of problems that affect users' functionality<sup>(10,11)</sup>.

Manners of using the ICF can vary, and it is possible to get information by means of evaluation, direct observation, reading of medical records, and asking questions. In this study, checklists were used with users who were already being assisted in the healthcare center<sup>(10,11,18)</sup>.

Although we are using the word “evaluation” with the ICF instrument, the checklist, it is noteworthy that the ICF is a classification system. It should be used because of its operational aspects, however not only because of them, as recommended by the WHO. It does not replace the professional evaluation, rather the opposite, it uses information that come from the professional evaluation<sup>(9,10)</sup>.

To use the checklists, the moments of initial evaluation, assignment, intervention and reevaluation were defined, according to the phases of the Rehabilitation cycle proposed by Rauch et al.<sup>(22)</sup>. Assignment and Intervention in the rehabilitation process relate to the phase of selection of each selected code qualifiers, and to the clinical intervention.

The total number of evaluations per sector was as follows: Homecare – 24 users in Physical Therapy, five in Speech and Language Therapy, and four in Psychology; Musculoskeletal Care – 17 users, 12 evaluated by Physical Therapy and five evaluated by Occupational Therapy; Multidisciplinary Team – five users, and Children's Speech and Language Therapy – 10 users.

Based on ICF qualifiers, it was possible to define degrees of functionality, which allowed to comparing the moments of evaluation and reevaluation. Such qualifiers were used as defined by the WHO, and are presented in Chart 1. Environmental Factors (e) can be regarded as facilitators (using a symbol “+” after the numerical code) or as barriers (using a dot after the numerical code). The domain can be classified as facilitator, if it positively affects the person's participation and functionality. Or it can be

**Chart 1.** Qualifiers / constructs used for the different components according to the impairment degree

xxx.0 – THERE IS NO problem (none, absent, insignificant) 0-4%
xxx.1- SLIGHT problem (light, small, ...) 5-24%
xxx.2 – MODERATE problem (medium, regular, ...) 25-49%
xxx.3 - SERIOUS problem (big, extreme, ...) 50-95%
xxx.4 – COMPLETE problem (total, ...) 96-100%
xxx.8 – Not specified
xxx.9 – No applicable

qualified as a barrier, if it negatively affects the participation and functionality<sup>(9,10)</sup>.

Qualifier 8 was used for Environmental Factors in all the checklists. The team considered difficult to measure how much the environment is a facilitator or a barrier, and they decided to use qualifier 8 (non-specified) instead. The structure (s) component was only used in the checklist for the Musculoskeletal Care, with a single code, due to the characteristics of this healthcare, for instance the use of orthoses.

The analysis of the checklist use results (step 3) occurred during a period of time defined and mutually agreed on with the group. Except for the Musculoskeletal Care, which care routine in the center totalizes 10 physical therapy sessions, for the other areas, a period of three months of follow-up was defined, between the evaluation and reevaluation by using checklists.

Checklists data were then transferred to an Excel spreadsheet, comprising the information of each user's evaluations, placing variables in columns and users in lines. This format was used because of the experience conducted in the municipality of Barueri-SP, which allows transforming the information into reading material through the system used in the SUS, and respective tabulation, if it is of the management interest to do that<sup>(23)</sup>.

To compare the distributions of answers to the evaluation and reevaluation items, the Wilcoxon test was conducted. All the qualifiers values defined by the ICF for Function and Structure, Activity and Participation, were respected. Only for environmental factors, the following values were used: 0 for Neutral, 1 for Facilitator, and 2 for Barriers.

## RESULTS

Out of the 26 professionals working in the center, 24 participated in the training for the use of ICF and construction of evaluation instruments (checklist), and 20 actually used the checklist, and participated of the final evaluation of the implementation process.

Groups developed six checklists: Homecare (Appendix A), three checklists per area: Physical Therapy, Speech and Language Therapy and Psychology (Appendix B): one common checklist in the outpatient care modality of Physical Therapy and Occupational Therapy; Multidisciplinary Team in Neurology composed of Physical Therapist, Occupational Therapist, Speech and Language Therapist and Psychologist, and Children's Speech and Language Therapy, one checklist.

Although ICF does not classify individual factors, it considers them in its structure, and the professionals are responsible to propose other more significant data. The professionals of the studied center included gender and age factors.

The use of checklists allowed to comparing the moments of evaluation and reevaluation regarding the categories selected by professionals of multiple areas.

Results show that indicators improved in all the sectors, showing an evolution of cases seen in the studied period. However, due to the reduced "n", they showed less robustness. The Function and Structure, and Activity and Participation components showing significant results in the Wilcoxon Test, are highlighted as follows.

Some examples, such as the Homecare Checklist in Physical Therapy, allowed to comparing the moments of evaluation and reevaluation, showing improvement in nearly all the categories of components "Body Function" and "Activity and Participation" (Table 1). In d450 - gait -, in the initial evaluation, of the 24 assisted users, 10 showed complete limitation (qualifier 4), 10 showed severe limitation (qualifier 3), 4 with moderate limitation, and none with mild limitation. In the reevaluation, findings showed such qualifiers have improved, and out of 24 users, 8 showed complete restriction, none showed severe alteration, the number of users with moderate restriction increased to 10, and there were 6 with mild restriction. In d460 - Moving through different places -, of the 24 users in the final evaluation, 10 showed complete restriction, 8 users had severe restriction, 5 with moderate restriction, 1 user with mild restriction, and

**Table 1.** Physical Therapy Home Care

Categories	Qualifiers									
	0	1	2	3	4	8	9	0	1	2
b1144 Orientation in relation to the space	0	1	2	3	4					
Evaluation	16	66.7%	1	4.2%	4	16.7%	2	8.3%	1	4.2%
Reevaluation	17	70.8%	2	8.3%	2	8.3%	2	8.3%	1	4.2%
Total	33	68.8%	3	6.3%	6	12.5%	4	8.3%	2	4.2%
b140 attention functions	0	1	2	3	4					
Evaluation	9	37.5%	6	25.0%	5	20.8%	3	12.5%	1	4.2%
Reevaluation	10	41.7%	10	41.7%	2	8.3%	2	8.3%	0	0.0%
Total	19	39.6%	16	33.3%	7	14.6%	5	10.4%	1	2.1%
b152 Emotional functions	0	1	2	3						
Evaluation	1	4.3%	10	43.5%	8	34.8%	4	17.4%		
Reevaluation	4	17.4%	12	52.2%	6	26.1%	1	4.3%		
Total	5	10.9%	22	47.8%	14	30.4%	5	10.9%		
b235 Vestibular function	0	1	2	3	4					
Evaluation	8	33.3%	2	8.3%	8	33.3%	3	12.5%	3	12.5%
Reevaluation	8	33.3%	11	45.8%	1	4.2%	1	4.2%	3	12.5%

Wilcoxon Test. Qualifiers: 0 = no problem; 1 = mild; 2 = moderate; 3 = severe; 4 = complete; 8 = not specified; 9 = not applicable. To "e" (Environmental Factors) 0 = Neutral; 1 = Facilitator; 2 = Barrier

**Table 1.** Continued...

Categories	Qualifiers									
Total	16	33.3%	13	27.1%	9	18.8%	4	8.3%	6	12.5%
b260 Proprioceptive function	0		1		2		3		4	
Evaluation	6	25.0%	3	12.5%	10	41.7%	5	20.8%	0	0.0%
Reevaluation	6	25.0%	13	54.2%	2	8.3%	2	8.3%	1	4.2%
Total	12	25.0%	16	33.3%	12	25.0%	7	14.6%	1	2.1%
b265 Tactile function	0		1		2		3		4	
Evaluation	7	29.2%	4	16.7%	7	29.2%	6	25.0%	0	0.0%
Reevaluation	10	41.7%	6	25.0%	5	20.8%	2	8.3%	1	4.2%
Total	17	35.4%	10	20.8%	12	25.0%	8	16.7%	1	2.1%
b280 Pain sensation	0		1		2		3		4	
Evaluation	3	12.5%	7	29.2%	9	37.5%	3	12.5%	2	8.3%
Reevaluation	7	29.2%	10	41.7%	3	12.5%	3	12.5%	1	4.2%
Total	10	20.8%	17	35.4%	12	25.0%	6	12.5%	3	6.3%
b710 Functions related to the articulations stability	1		2		3		4			
Evaluation	3	12.5%	5	20.8%	14	58.3%	2	8.3%		
Reevaluation	11	45.8%	6	25.0%	4	16.7%	3	12.5%		
Total	14	29.2%	11	22.9%	18	37.5%	5	10.4%		
b730 Function of muscular strength	1		2		3		4			
Evaluation	2	8.3%	8	33.3%	11	45.8%	3	12.5%		
Reevaluation	10	41.7%	9	37.5%	1	4.2%	4	16.7%		
Total	12	25.0%	17	35.4%	12	25.0%	7	14.6%		
b735 Tonus	0		1		2		3		4	
Evaluation	2	8.3%	2	8.3%	7	29.2%	11	45.8%	2	8.3%
Reevaluation	3	12.5%	7	29.2%	10	41.7%	3	12.5%	1	4.2%
Total	5	10.4%	9	18.8%	17	35.4%	14	29.2%	3	6.3%
b760 Functions related to voluntary movements	0		1		2		3			
Evaluation	8	33.3%	1	4.2%	5	20.8%	10	41.7%		
Reevaluation	8	33.3%	5	20.8%	8	33.3%	3	12.5%		
Total	16	33.3%	6	12.5%	13	27.1%	13	27.1%		
b765 Functions related to involuntary movements	0		1		2		3			
Evaluation	14	58.3%	3	12.5%	5	20.8%	2	8.3%		
Reevaluation	14	58.3%	7	29.2%	1	4.2%	2	8.3%		
Total	28	58.3%	10	20.8%	6	12.5%	4	8.3%		
b770 Functions related to gait pattern	0		1		2		3		4	
Evaluation	1	4.2%	1	4.2%	1	4.2%	10	41.7%	11	45.8%
Reevaluation	1	4.2%	7	29.2%	8	33.3%	0	0.0%	8	33.3%
Total	2	4.2%	8	16.7%	9	18.8%	10	20.8%	19	39.6%
d410 Change the basic body position	0		1		2		3		4	
Evaluation	2	8.3%	4	16.7%	9	37.5%	7	29.2%	2	8.3%
Reevaluation	5	20.8%	11	45.8%	5	20.8%	1	4.2%	2	8.3%
Total	7	14.6%	15	31.3%	14	29.2%	8	16.7%	4	8.3%
d415 Keep the body position	0		1		2		3		4	
Evaluation	2	8.7%	5	21.7%	10	43.5%	4	17.4%	2	8.7%
Reevaluation	5	21.7%	10	43.5%	4	17.4%	2	8.7%	2	8.7%
Total	7	15.2%	15	32.6%	14	30.4%	6	13.0%	4	8.7%
d445 Use of hand and arm	0		1		2		3		4	
Evaluation	6	25.0%	3	12.5%	7	29.2%	3	12.5%	5	20.8%
Reevaluation	7	29.2%	6	25.0%	4	16.7%	3	12.5%	4	16.7%

Wilcoxon Test. Qualifiers: 0 = no problem; 1 = mild; 2 = moderate; 3 = severe; 4 = complete; 8 = not specified; 9 = not applicable. To "e" (Environmental Factors) 0 = Neutral; 1 = Facilitator; 2 = Barrier

**Table 1.** Continued...

Categories	Qualifiers											
Total	13	27.1%	9	18.8%	11	22.9%	6	12.5%	9	18.8%		
d450 Gait	1		2		3		4					
Evaluation	0	0.0%	4	16.7%	10	41.7%	10	41.7%				
Reevaluation	6	25.0%	10	41.7%	0	0.0%	8	33.3%				
Total	6	12.5%	14	29.2%	10	20.8%	18	37.5%				
d460 Moving through different places	0		1		2		3		4			
Evaluation	0	0.0%	1	4.2%	5	20.8%	8	33.3%	10	41.7%		
Reevaluation	2	8.3%	6	25.0%	9	37.5%	0	0.0%	7	29.2%		
Total	2	4.2%	7	14.6%	14	29.2%	8	16.7%	17	35.4%		
d465 Moving using an equipment	0		1		2		3		4		9	
Evaluation	2	8.3%	3	12.5%	7	29.2%	6	25.0%	5	20.8%	1	4.2%
Reevaluation	7	29.2%	9	37.5%	1	4.2%	2	8.3%	4	16.7%	1	4.2%
Total	9	18.8%	12	25.0%	8	16.7%	8	16.7%	9	18.8%	2	4.2%
e1101 Medicines.	0		1									
Evaluation	10	41.7%	14	58.3%								
Reevaluation	10	41.7%	14	58.3%								
Total	20	41.7%	28	58.3%								
e1201 Health care products and technology for personal mobility and transportation	0		1		2							
Evaluation	4	16.7%	5	20.8%	15	62.5%						
Reevaluation	4	16.7%	10	41.7%	10	41.7%						
Total	8	16.7%	15	31.3%	25	52.1%						
e210 Physical geography	0		1		2							
Evaluation	13	56.5%	4	17.4%	6	26.1%						
Reevaluation	13	54.2%	5	20.8%	6	25.0%						
Total	26	55.3%	9	19.1%	12	25.5%						
e355 Health care professionals	0		1		2							
Evaluation	4	16.7%	17	70.8%	3	12.5%						
Reevaluation	4	16.7%	18	75.0%	2	8.3%						
Total	8	16.7%	35	72.9%	5	10.4%						
e398 Support and relationship, others specified	0		1		2							
Evaluation	9	37.5%	12	50.0%	3	12.5%						
Reevaluation	9	37.5%	12	50.0%	3	12.5%						
Total	18	37.5%	24	50.0%	6	12.5%						
e498 Attitudes, others specified	0		1		2							
Evaluation	9	37.5%	10	41.7%	5	20.8%						
Reevaluation	9	37.5%	10	41.7%	5	20.8%						
Total	18	37.5%	20	41.7%	10	20.8%						
e570 Social security related services, systems and policies	0		1		2							
Evaluation	11	45.8%	9	37.5%	4	16.7%						
Reevaluation	12	50.0%	9	37.5%	3	12.5%						
Total	23	47.9%	18	37.5%	7	14.6%						

Wilcoxon Test. Qualifiers: 0 = no problem; 1 = mild; 2 = moderate; 3 = severe; 4 = complete; 8 = not specified; 9 = not applicable. To "e" (Environmental Factors) 0 = Neutral; 1 = Facilitator; 2 = Barrier

no patient with no restriction. In the reevaluation, such picture changed to 7 with complete restriction, no user with severe restriction, 9 with moderate restriction, 6 users with mild restriction, and 2 with no restriction.

In the Musculoskeletal Care in Physical Therapy, for users with RSI/WRD assisted in a therapeutic program of ten

sessions, the use of the Checklist evidences the problem-solving capacity of the center in the following categories: b280 – pain sensation – in the initial evaluation of 12 users, 1 showed the qualifier complete (4); 8 with the qualifier severe (3), and 3 users showed the qualifier moderate (2). In the reevaluation, no user had the qualifier complete (4), 3 users with the qualifier severe

(3), 1 user with the qualifier moderate (2), 7 with the qualifier mild (1), and 1 user did not feel pain, and was assigned with qualifier (0). Although the sector professionals stated that the categories selected to compose the checklists fulfilled the needs, results showed that such evaluations were those most presenting qualifier 9 (not applicable).

The checklist of Children's Speech and Language Therapy (Table 2) showed qualifiers evolution in nearly all the categories. The highlights are d132 (Language acquisition), d137 (Concepts acquisition), d160 (Focusing the attention), d166 (Reading), and d330 (Speech). Assisted children were in school age and showed alterations in the learning process.

**Table 2.** Children Speech and Language Therapy

Categories					Qualifiers					
b140 Attention functions	0		1		2					
Evaluation	4	40.0%	4	40.0%	2	20.0%				
Reevaluation	6	60.0%	4	40.0%	0	0.0%				
Total	10	50.0%	8	40.0%	2	10.0%				
b144 Memory functions	0		1		2					
Evaluation	5	50.0%	3	30.0%	2	20.0%				
Reevaluation	8	80.0%	2	20.0%	0	0.0%				
Total	13	65.0%	5	25.0%	2	10.0%				
b147 Psychomotor functions	0		1		2					
Evaluation	6	60.0%	3	30.0%	1	10.0%				
Reevaluation	8	80.0%	2	20.0%	0	0.0%				
Total	14	70.0%	5	25.0%	1	5.0%				
b152 Emotional functions	0		1		2					
Evaluation	4	40.0%	1	10.0%	5	50.0%				
Reevaluation	7	70.0%	3	30.0%	0	0.0%				
Total	11	55.0%	4	20.0%	5	25.0%				
b1560 Hearing perception	0		1		2		3			
Evaluation	3	30.0%	2	20.0%	4	40.0%	1	10.0%		
Reevaluation	7	70.0%	3	30.0%	0	0.0%	0	0.0%		
Total	10	50.0%	5	25.0%	4	20.0%	1	5.0%		
b1561 Visual perception	0		1							
Evaluation	5	50.0%	5	50.0%						
Reevaluation	10	100.0%	0	0.0%						
Total	15	75.0%	5	25.0%						
b1670 Language recognition	0		1							
Evaluation	8	80.0%	2	20.0%						
Reevaluation	10	100.0%	0	0.0%						
Total	18	90.0%	2	10.0%						
b1671 Language expression	0		1		2		3		4	
Evaluation	0	0.0%	1	10.0%	5	50.0%	1	10.0%	3	30.0%
Reevaluation	2	20.0%	7	70.0%	1	10.0%	0	0.0%	0	0.0%
Total	2	10.0%	8	40.0%	6	30.0%	1	5.0%	3	15.0%
b310 Voice function	0		1		2					
Evaluation	9	90.0%	0	0.0%	1	10.0%				
Reevaluation	9	90.0%	1	10.0%	0	0.0%				
Total	18	90.0%	1	5.0%	1	5.0%				
b320 Articulation functions	0		1		2		3		4	
Evaluation	0	0.0%	1	10.0%	3	30.0%	3	30.0%	3	30.0%
Reevaluation	2	20.0%	7	70.0%	1	10.0%	0	0.0%	0	0.0%
Total	2	10.0%	8	40.0%	4	20.0%	3	15.0%	3	15.0%
b330 Functions of speech fluency and rhythm	0		1							
Evaluation	9	90.0%	1	10.0%						
Reevaluation	10	100.0%	0	0.0%						
Total	19	95.0%	1	5.0%						
d132 Language acquisition	0		1		2					

Wilcoxon Test. Qualifiers: 0 = no problem; 1 = mild; 2 = moderate; 3 = severe; 4 = complete; 8 = not specified; 9 = not applicable. To "e" (Environmental Factors) 0 = Neutral; 1 = Facilitator; 2 = Barrier

**Table 2.** Continued...

Categories	Qualifiers									
Evaluation	7	70.0%	2	20.0%	1	10.0%				
Reevaluation	9	90.0%	1	10.0%	0	0.0%				
Total	16	80.0%	3	15.0%	1	5.0%				
d137 Concepts acquisition	0		1		2					
Evaluation	3	30.0%	5	50.0%	2	20.0%				
Reevaluation	8	80.0%	2	20.0%	0	0.0%				
Total	11	55.0%	7	35.0%	2	10.0%				
d160 Focusing the attention	0		1		2					
Evaluation	3	30.0%	5	50.0%	2	20.0%				
Reevaluation	8	80.0%	2	20.0%	0	0.0%				
Total	11	55.0%	7	35.0%	2	10.0%				
d166 Reading	0		2		3		9			
Evaluation	1	10.0%	3	30.0%	1	10.0%	5	50.0%		
Reevaluation	5	50.0%	0	0.0%	0	0.0%	5	50.0%		
Total	6	30.0%	3	15.0%	1	5.0%	10	50.0%		
d170 Writing	0		1		2		3		9	
Evaluation	1	10.0%	1	10.0%	1	10.0%	2	20.0%	5	50.0%
Reevaluation	4	40.0%	1	10.0%	0	0.0%	0	0.0%	5	50.0%
Total	5	25.0%	2	10.0%	1	5.0%	2	10.0%	10	50.0%
d310 Communication-reception of oral messages	0		1							
Evaluation	8	80.0%	2	20.0%						
Reevaluation	10	100.0%	0	0.0%						
Total	18	90.0%	2	10.0%						
d325 Communication-reception of written messages	0		1		2		3		9	
Evaluation	2	20.0%	1	10.0%	1	10.0%	1	10.0%	5	50.0%
Reevaluation	4	40.0%	1	10.0%	0	0.0%	0	0.0%	5	50.0%
Total	6	30.0%	2	10.0%	1	5.0%	1	5.0%	10	50.0%
d330 Speech	0		1		2		3		4	
Evaluation	0	0.0%	2	22.2%	4	44.4%	2	22.2%	1	11.1%
Reevaluation	4	44.4%	4	44.4%	1	11.1%	0	0.0%	0	0.0%
Total	4	22.2%	6	33.3%	5	27.8%	2	11.1%	1	5.6%
d710 Basic interpersonal interactions	0		1		2					
Evaluation	6	60.0%	1	10.0%	3	30.0%				
Reevaluation	7	70.0%	3	30.0%	0	0.0%				
Total	13	65.0%	4	20.0%	3	15.0%				
d760 Family Relations	0		1		2					
Evaluation	6	60.0%	1	10.0%	3	30.0%				
Reevaluation	7	70.0%	3	30.0%	0	0.0%				
Total	13	65.0%	4	20.0%	3	15.0%				
d820 School Education	0		1		2					
Evaluation	6	60.0%	2	20.0%	2	20.0%				
Reevaluation	7	70.0%	2	20.0%	1	10.0%				
Total	13	65.0%	4	20.0%	3	15.0%				
d920 Recreation and Leisure	0		1		2					
Evaluation	8	80.0%	1	10.0%	1	10.0%				
Reevaluation	8	80.0%	2	20.0%	0	0.0%				
Total	16	80.0%	3	15.0%	1	5.0%				
e330 Persons in position of authority			1							
Evaluation			10	100.0%						

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**Table 2.** Continued...

Categories		Qualifiers				
Reevaluation		10	100.0%			
Total		20	100.0%			
e410 Individual attitudes of the core family	0	1		2		
Evaluation	0	0.0%	7	70.0%	3	30.0%
Reevaluation	1	10.0%	6	60.0%	3	30.0%
Total	1	5.0%	13	65.0%	6	30.0%
e415 Individual attitudes of the expanded family	0		1		2	
Evaluation	3	30.0%	3	30.0%	4	40.0%
Reevaluation	4	40.0%	3	30.0%	3	30.0%
Total	7	35.0%	6	30.0%	7	35.0%
e420 Individual attitudes of friends	0		1		2	
Evaluation	2	20.0%	6	60.0%	2	20.0%
Reevaluation	3	30.0%	6	60.0%	1	10.0%
Total	5	25.0%	12	60.0%	3	15.0%
e355 Health care professionals	0		1		2	
Evaluation	0	0.0%	9	90.0%	1	10.0%
Reevaluation	1	10.0%	9	90.0%	0	0.0%
Total	1	5.0%	18	90.0%	1	5.0%

Wilcoxon Test. Qualifiers: 0 = no problem; 1 = mild; 2 = moderate; 3 = severe; 4 = complete; 8 = not specified; 9 = not applicable. To "e" (Environmental Factors) 0 = Neutral; 1 = Facilitator; 2 = Barrier

## DISCUSSION

To underpin and discuss the results, the experiences in healthcare services and systems in the literature were taken into consideration, especially those in Italy, England and Germany, and also successful experiences in Brazil, such as the case of the Evaluation for Granting the Continuous Benefit for Disabled Person, and of the experience in the municipality of Barueri<sup>(5,11-15,22,23)</sup>.

Since the beginning of this research on the ICF implementation process, during the training period, the team showed to understand the importance of its conceptual model. Furthermore, professionals showed to be open to its implementation in the center, being enthusiastic with the possibility of capturing important elements from the evaluations in their fields of activity, and systematize them with the ICF. Data systematization, possibility of generating indicators and their contribution to qualify the healthcare, was a recurring topic highlighted by the professionals. National and international initiatives corroborating this finding were also identified<sup>(12-16)</sup>.

In the perception of participants and of the researcher, who also works in the center, the team training, the initial step of this research, provided a better understanding of the ICF structure, of the manners to use it, and of the importance of a common language. It allows the description of clinical-therapeutic practices of several areas based on concepts, such as functionality and disability, in light of a new multidimensional perspective of disability, and the possibility of incorporating a new healthcare paradigm to the professional routine.

Results showed that the contact with the ICF allowed participants to select categories aimed to build checklists, develop evaluation instruments that could reflect the assistance

provided by the center. It also contributed to demystify the first impression, that the use of the ICF and its alphanumerical system was difficult, of those professionals in the beginning of the process.

The findings corroborate models implemented in other countries that show that, after the ICF training, health professionals have conditions to operationalize the Classification in their routine, and to structure their interventions with more focus on participation and environment<sup>(5,11-13)</sup>.

Results also show that the construction of a tool based on the reality of the healthcare center, which portrays its local needs, is essential. The collective creation of instruments, working with the Classification components, domains, categories and structure showed to be important for the experience and expansion of the biopsychosocial approach in the clinical practice, as well as to ensure the routine use of the classification, as stated by the professionals themselves at the end of the process<sup>(13-16)</sup>.

The use of checklists allowed more visibility of the work process of several areas, creating indicators of problem-solving capacity for the assistance provided in each modality, being useful to plan healthcare based on the needs of both users and professionals, which is similar to the findings in other existent studies<sup>(22-24)</sup>. Findings also allow to classify and measure the functionality based on the use of ICF qualifiers, the degree of commitment, in addition to showing the evolution of participant users, which corroborates the studies already conducted<sup>(25,26)</sup>.

Checklists show the evolution of cases in the four sectors involved in this research, after an intervention period, in the domains of Body Functions (b) and of the Activities and Participation components (d). In Environmental Factors (e), there was also an evolution. However, although professionals repeatedly state the importance of the environment and its impact

on the user's rehabilitation, findings evidence difficulties to classify it, starting with the choice of categories to be included in the checklist done by some professionals.

Most robust results of some sectors are highlights, by relating such results to the final goal of the healthcare. In Physical Therapy homecare, more users got more independency and mobility improvement, also improving their participation in the environment. In chronic cases, there was an improvement of their life quality. It is noteworthy that the users of this kind of healthcare modality have serious or acute health conditions, and their reevaluation occurred three months after the therapeutic intervention, which is considered relevant for this clinical profile. In the Musculoskeletal Care in Physical Therapy, in which the assisted population has Repetitive Strain Injury (RSI) and Work Related Diseases (WRD), pain is a recurring finding in the physical therapy evaluation, and the results of checklist use reveal that indicators improved after a therapeutic program of 10 sessions.

The ICF operationalization process in the healthcare center changed the assistance provided by Physical Therapy in the Musculoskeletal sector. The physical therapist started to define the therapeutic plan, including the number of physical therapy sessions, which was no longer based on the medical evaluation.

The Sector of Children's Speech and Language Therapy, which goal is to provide healthcare to children in school age with learning alterations, including speech and writing, shows important evolution indicators for the education process. The improvement of indicators, such as those for language acquisition, concepts acquisition, focusing the attention, and speech, are key for development and learning. Alterations in such categories cause important impacts on the school life, on children's learning process, but also, and no less important, on other areas: social, family and routine<sup>(27)</sup>.

Results also confirm that checklists developed by professionals allowed to longitudinally monitor users in the therapeutic process, because data are measurable, but also because they orientate the ICF implementation process in this healthcare center. They are also applicable to other services, which reiterates the importance of the conduction of new studies on ICF instruments, as shown by the study pointing out the scarcity of data on functionality, and the importance of generating sound evidences, to ensure appropriate responses in healthcare and social systems<sup>(24)</sup>.

The checklists, incorporated to the routine of the study healthcare center, can serve as a documentation about the users' health conditions, contributing to define goals for the rehabilitation plan, as shown by other studies<sup>(5,25,26)</sup>. Therefore, they can allow professionals and users to have clearer therapeutic goals, identifying what users actually do (performance) and what they are capable of doing (capacity), and how much that impacts the several life situations (participation), as well as to define more specific goals that are significant for users, as evidenced by the findings of this study<sup>(25,26,28)</sup>.

The results of the implementation process were presented to the participant team, as well as for all the managers, the Municipal Secretary of Health amongst them. Thus, checklists can be used by the local management, and provide the work process of several areas with more visibility, obtaining problem-solving indicators for the healthcare assistance provided, in addition to be useful

to plan the healthcare based on the users' and professionals' needs, corroborating studies in the literature<sup>(15,23-26)</sup>.

Findings evidence that, in addition to allowing users' evaluation in two different moments, the construction of the checklist also allowed professionals to think about their own praxis in clinical terms. Constructing the ICF-based evaluation instrument worked as a methodology to put the biopsychosocial approach in to practice. Using the knowledge acquired during the training and reviewing one's action strategies when thinking about one's work routine allowed professionals to have a "mental model" to think about and use the ICF<sup>(5)</sup>. Meanwhile, to operationalize the ICF by means of instruments made possible what most of the professionals involved in this study, in the beginning of the process, regarded as impossible.

The use of the ICF by those professionals, in this process of implementation in healthcare, was restricted to the steps of the study. To incorporate it into the routine, it will be necessary to consider the limitations showed in this research. It is necessary to reevaluate checklists developed by the group as for the choice of categories, especially those having 9 (not applicable) as the selected qualifier, evident in the Musculoskeletal Care in Physical Therapy, for instance. Environmental Factors, although very mentioned during the entire training process because they are directly involved in the entire process of user's rehabilitation, frequently showed the neutral qualifier (0) in the results.

The difficulty mentioned by some professionals regarding the use of qualifiers is another issue, especially as for the moderate level (s), indicating the need to work more on the manners how professionals measure them in their work routine, and to expand the discussion during the team training step. Furthermore, results reiterate the importance of discussing with the team and managers how to incorporate those checklists to the routine of professionals, so that they do not become just another instrument or form to be used, taking more from the already limited time of the team, in view of the existence of so many demands in the healthcare routine.

We highlight the importance of using the ICF results in the creation of the healthcare service databank, containing the information about the instruments used, and thus the information about each user. It is noteworthy that electronic medical records are the subject of discussions for future implementation in the healthcare center. To allow ways to incorporate the ICF checklists to the medical records would be a way of introducing them in the healthcare service routine.

As discussed in the literature, the viability of the ICF systematization closely relates to the training of professionals from different health environments, to the integration of the information produced, and to their articulation with health information systems. This would contribute to the qualification of health information, thus reducing information duplicity, fragmentation and redundancy in the communication within the healthcare network<sup>(5,11,13)</sup>.

## CONCLUSION

Results show that training the use of the ICF in this healthcare center allowed professionals to be knowledgeable about its structure, based on the biopsychosocial health approach, which is key for the ICF operationalization by means of constructing and

using evaluation instruments fit for the local reality and users' needs, and prospectively to ensure their use in the healthcare routine. The selection of ICF codes and categories by those professionals based on their clinical practice was essential to attain such goal.

The construction of checklists was necessary and contributed to the ICF operationalization in the healthcare center. Important issues though were raised regarding the consensual use of ICF qualifiers by the different areas in this study, and the importance of reviewing the choice of checklist codes before incorporating them to the information system.

The collective construction was a key-factor for the positive results of the ICF implementation process, because it contributed to the valorization of the change process.

This study evidences the usefulness of the ICF to construct databanks with users' functionality and healthcare problem-solving indicators. For the professionals, the experience of using the ICF allows the inclusion of the participation component in the routine practice. Therefore, it expands the focus of the body function for the user-centered clinical practice.

The findings show that the ways of operationalizing the ICF contribute to overcome the biomedical perspective, opening up possibilities to incorporate a biopsychosocial approach into the healthcare routine, thus stimulating different healthcare, individual and praxis perspectives. Understanding functionality as the dynamic interaction between an individual's health conditions, environmental factors and individual factors means to apprehend such individual's routine with its variations, planning interventions to remove barriers in several contexts. This is vital in planning rehabilitation for a humanized healthcare.

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### **Author contributions**

*We declare that MCPB has participated in the elaboration of the project, data collection and analysis, and writing of the article. RYSC has participated in the elaboration of the project, and writing of the article.*

**Appendix A.** Checklist used by Physical Therapy, Speech and Language Therapy, and Psychology for Homecare of adult/elderly patients with neurological disorders

**PHYSICAL THERAPY HOME CARE**

Code Description	Qualifiers.													
	Evaluation								Reevaluation					
	0	1	2	3	4	8	9	0	1	2	3	4	8	9
b1144 Guidance regarding the space														
b140 Functions of attention														
b152 Emotional Functional														
b235 Vestibular Function														
b260 Proprioceptive Function														
b265 Tactile Function														
b280 Pain Sensation														
b710 Functions related to the articulations stability.														
b730 Function of muscular strength														
b735 Tonus														
b760 Functions related to voluntary movements														
b765 Functions related to involuntary movements														
b770 Functions related to gait pattern														
d410 Change the basic position of the body														
d415 Keep the position of the body														
d445 Use of hand and arm														
d450 Gait														
d460 Moving through different places														
d465 Moving using some kind of equipment														

Environmental Factors	Qualifiers		
Code Description	Facilitator +8	Barrier .8	Neutral
	Evaluation	Reevaluation	
e1101 Medicines			
e1201 Health care products and technologies for personal mobility and transportation in internal and external environments			
e210 Physical geography			
e355 Health care professionals			
e398 Support and relationship, others specified			
e498 Attitudes, others specified			
e570 Social security related services, systems and policies			

**SPEECH AND LANGUAGE THERAPY HOME CARE**

Code Description	Evaluation								Reevaluation					
	0	1	2	3	4	8	9	0	1	2	3	4	8	9
b164 Superior cognitive functions														
b1670 Language reception														
b1671 Language expression														
b310 Voice function														
b320 Articulation functions														
b5105 Deglutition														
d166 Reading														
d170 Writing														
d310 Communication-reception of oral messages														
d325 Communication-reception of written messages														
d330 Speech														
d350 Conversation														
d570 Take care of one's own health														
d710 Basic interpersonal interactions														
d920 Recreation and leisure														

Environmental Factor	Qualifiers		
Code Description	Facilitator +8	Barrier .8	Neutral 0
e2109 Physical geography	Evaluation	Reevaluation	
e355 Health care professionals			
e360 Other professionals			
e398 Support and relationship, others specified			
.e498 Attitudes, others specified			
e570 Social security related services, systems and policies			

**PSYCHOLOGY HOME CARE**

Code Description	Qualifiers													
	Evaluation								Reevaluation					
	0	1	2	3	4	8	9	0	1	2	3	4	8	9
b152 Emotional functions														
b164 Superior cognitive functions														
d310 Communication-reception of oral messages														
d350 Conversation														
d465 Moving using some kind of equipment														
d470 Use of transportation														
d520 Take care of body parts														
d570 Take care of one's own health														
d640 Perform domestic tasks														
d710 Basic interpersonal interactions														
d720 Complex interpersonal interactions														
d779 Private interpersonal relationships, others specified and not specified														
d860 Economic transactions														
d920 Recreation and leisure														

Environmental Factors	Qualifiers		
Code Description	Facilitator +8	Barrier .8	Neutral 0
e1101 Medicines.			
e210 Physical geography			
e398 Support and relationship, others specified			
e355 Health care professionals			
e360 Other professionals			
e410 Individual attitudes of core family members			
e498 Attitudes, others specified			
e570 Social security related services, systems and policies			
e575 Social support generally related services, systems and policies			

**Appendix B.** Checklist used in Musculoskeletal Care

Code Description	Qualifiers													
	Evaluation							Reevaluation						
	0	1	2	3	4	8	9	0	1	2	3	4	8	9
b235 Vestibular function														
b260 Proprioceptive function														
b265 Tactile function														
b280 Pain sensation														
b710 Functions related to the articulations mobility														
b715 Functions related to the articulations stability														
b730 Function of muscular strength														
b735 Tonus														
b770 Functions related to the gait pattern														
s770 Additional musculoskeletal structures related to movement														
d179 Application of knowledge, other specified														
d410 Change the basic body position														
d440 Fine use of hand														
d445 Use of hand and arm														
d450 Gait														
d460 Moving through different places														
d698 Domestic life, other specified														

Environmental Factors Code Description	Qualifiers		
	Facilitator +8	Barrier .8	Neutral
e1101 Medicines			
e1151 Health care products and technologies for personal use in the everyday life			
e1201 Health care products and technologies for personal mobility and transportation in internal and external environments			
e355 Health care professionals			
e498 Attitudes, others specified			
e590 Work and employment related services, systems and policies			

## ERRATUM

In the article entitle “Operationalization of the international classification of functioning, disability and health in a Specialized Rehabilitation Center”, DOI number: <http://dx.doi.org/10.1590/2317-1782/20192019046>, published in journal CoDAS, 2020, vol.32, number 2, in the version portuguese and english of the title, respectively (page 1):

Where it reads:

“Operacionalização da funcionalidade, incapacidade e saúde em Centro Especializado em Reabilitação”

and

“Operationalization of the international classification of functioning, disability and health in a Specialized Rehabilitation Center”

It should read:

“Operacionalização da Classificação Internacional de Funcionalidade, Incapacidade e Saúde, CIF, em um Centro Especializado em Reabilitação”

and

“Operationalization of the International Classification of Functioning, Disability and Health, ICF, in a Specialized Rehabilitation Center”

