DOI: 10.1590/1809-2950/e21002523en

ORIGINAL RESEARCH

Construction and validation of an instrument for physical therapy assessment and functional classification in the biopsychosocial model of the International Classification of Functioning, Disability and Health (ICF) for hospitalized HIV patients

Construção e validação de instrumento de avaliação fisioterapêutica e de classificação funcional no modelo biopsicossocial da Classificação Internacional de Funcionalidade, Incapacidade e Saúde (CIF) para pacientes HIV hospitalizados

Construcción y validación de un instrumento de evaluación fisioterapéutica y de clasificación funcional en el modelo biopsicosocial de la Clasificación Internacional del Funcionamiento, de la Discapacidad y de la Salud (CIF) para pacientes VIH hospitalizados

Paula Chomem[1], Nelma Sue Kuwaki[2], Cesar Felipe Carraro[3], Rubneide Barreto Silva Gallo[4], Vera Lúcia Israel[5]

ABSTRACT | The human immunodeficiency virus (HIV) is responsible for the compromise of the immune system and a high number of hospitalizations. Considering the biopsychosocial (BPS) context of the individual, the International Classification of Functioning, Disability and Health (ICF) provides the maximum description of a health condition and the impact of interventions and service delivery for the physiotherapeutic process. The aim of this study was to build and validate a physical therapy assessment and functional classification instrument based on the ICF for hospitalized members of the HIV community. This is an observational, cross-sectional, and descriptive study based on the analysis of demand, elaboration, and improvement of the instrument and its validation with the consensus of a experts committee of physical therapists; they evaluated 58 items and the classification codes resulted in 0.858 overall Kappa value=strong agreement between assessments, all statistically significant (p-value<0.05). The final version of the instrument included 36 items, all with Kappa coefficient >0.80. The constructed instrument is valid for the evaluation and functional classification in the ICF model for hospitalized members of the HIV community, contributing to the physical therapy clinical practice in the hospital environment.

Keywords | Physical Therapy Department, Hospital; HIV; International Classification of Functioning, Disability and Health.

RESUMO | O vírus da imunodeficiência humana (HIV – *human immunodeficiency virus*) é responsável pelo comprometimento do sistema imune e por um elevado número de hospitalizações. Considerando o contexto biopsicossocial (BPS) do indivíduo, o processo fisioterapêutico dispõe da Classificação Internacional de Funcionalidade, Incapacidade e Saúde (CIF), que fornece a máxima descrição de uma condição de saúde e o impacto das intervenções e prestação de serviços. O objetivo deste estudo é construir e validar um instrumento de avaliação fisioterapêutica e classificação funcional baseada na CIF para os pacientes HIV hospitalizados. Trata-se de um estudo observacional, transversal e descritivo realizado a partir da análise de demanda, elaboração e

Paper presented at the *IV Congresso dos Programas de Residência do Complexo do Hospital de Clínicas da Universidade Federal do Paraná* (CHC-UFPR) on February 11, 2021.

[1]Universidade Federal do Paraná (UFPR) – Curitiba (PR), Brazil. E-mail: paulachomem@gmail.com. ORCID-0000-0003-4298-6237
[2]Universidade Federal do Paraná (UFPR) – Curitiba (PR), Brazil. E-mail: nelma.kw7@gmail.com. ORCID-0000-0001-9361-8579
[3]Universidade Federal do Paraná (UFPR) – Curitiba (PR), Brazil. E-mail: cesarcarraro80@gmail.com. ORCID-0000-0001-6152-5036
[4]Universidade Federal do Paraná (UFPR) – Curitiba (PR), Brazil. E-mail: rubneidegallo@gmail.com. ORCID-0000-0001-9953-0260
[5]Universidade Federal do Paraná (UFPR) – Curitiba (PR), Brazil. E-mail: veral.israel@gmail.com. ORCID-0000-0001-5824-7792

Corresponding address: Paula Chomem – Rua Doutor Faivre, 63 – Curitiba (PR), Brazil – ZIP Code: 80060-140 – E-mail: paulachomem@gmail.com– Financing source: nothing to declare – Conflict of interests: nothing to declare – Presentation: Feb. 7th, 2021 – Accepted for publication: Nov. 28th, 2022 – Approved by the Research Ethics Committee: Protocol No. 3,819,191.

aprimoramento do instrumento e sua validação com o consenso de um comitê de fisioterapeutas especialistas que avaliaram 58 itens e os códigos de classificação, resultando no valor kappa geral de 0,858=concordância forte entre as avaliações, todas estatisticamente significativas (p<0,05). A versão final do instrumento incluiu 36 itens, todos com índice kappa >0,80. O instrumento construído apresenta validade para a avaliação e classificação funcional no modelo da CIF para os pacientes HIV hospitalizados, contribuindo para a prática clínica fisioterapêutica no ambiente hospitalar.

Descritores | Serviço Hospitalar de Fisioterapia; HIV; Classificação Internacional de Funcionalidade, Incapacidade e Saúde.

RESUMEN | El virus de la inmunodeficiencia humana (VIH) es responsable del deterioro del sistema inmunitario y de un elevado número de hospitalizaciones. Considerando el contexto biopsicosocial (BPS) del individuo, el proceso fisioterapéutico cuenta con la Clasificación Internacional del Funcionamiento, de la Discapacidad y de la Salud (CIF), que brinda la máxima descripción de una condición de salud y el impacto de las intervenciones y prestación de servicios. El objetivo de este estudio es construir y validar un instrumento de evaluación fisioterapéutica y clasificación funcional basado en el CIF para pacientes VIH hospitalizados. Se trata de un estudio observacional, transversal y descriptivo, realizado desde el análisis de la demanda, desarrollo y perfeccionamiento del instrumento y su validación con el consenso de un comité de fisioterapeutas especialistas que evaluaron 58 ítems y los códigos de clasificación, lo que resultó un valor kappa global 0,858=fuerte concordancia entre las evaluaciones, todas estadísticamente significativas (p<0,05). La versión final del instrumento incluyó 36 ítems, todos con índice kappa >0,80. El instrumento construido presenta validez para la evaluación y clasificación funcional en el modelo CIF para pacientes con VIH hospitalizados, lo que contribuye a la práctica clínica fisioterapéutica en el ámbito hospitalario.

Palabras clave | Servicio de Fisioterapia en Hospital; VIH; Clasificación Internacional del Funcionamiento, de la Discapacidad y de la Salud.

INTRODUCTION

Among the specialties available in a hospital, the infectious disease sector provides care for people infected by the human immunodeficiency virus (HIV)[1]. The virus compromises the immune system, specifically CD4+ T lymphocytes, triggering inflammatory changes and direct damage to certain organs throughout the course of infection[2,3].

Clinical manifestations vary depending on the time of infection and correspond to the phases of acute infection, asymptomatic, and acquired immunodeficiency syndrome (AIDS), in which CD4+ T count decreases in the blood, making the body more susceptible to the emergence of opportunistic diseases and neoplasms[2,3]. In addition to the high number of hospitalizations[4,5], patients become vulnerable to frailty situations, including physical (motor, neurological, and respiratory sequelae), social (intrafamilial and social prejudice, unemployment), and environmental (family core and insufficient access to health services)[6–9].

The concept of health as a state of complete physical, mental, and social well-being requires integral and biopsychosocial (BPS) healthcare to the individual. According to the World Health Organization (WHO), in the manual of the International Classification of Functioning, Disability and Health (ICF), the BPS model, at the different levels of healthcare, is an opportunity to understand not only the disease, but to consider all the dimensions of human functionality and its contexts[10].

The use of ICF as a tool for classifying and describing the health condition of people living with HIV is found worldwide. Studies conducted in South Africa applied the BPS model to describe the health status of participants in different stages of the disease, raising knowledge about different contexts and levels of health care and their influence on functionality[11].

The elaboration of intervention proposals requires the individual's evaluation and functional classification by a physical therapist, a health professional who constantly works with the concept of functionality at all levels of care complexity[12]. The ICF's more than 1,400 categories and diverse domains enable the maximum description of a health condition using a single and international language. The instrument indicates issues of different social dimensions and the impact of interventions and service delivery on a person's health[10,13]. Functionality is currently the third health indicator[14], which benefits the physical therapist's view of tertiary care.

Using the ICF BPS model in hospital environments can be useful considering the reality of people living with HIV, who are subjected to successive hospitalizations. This classification model can be used to functionally compare the different periods in which the individual

remained hospitalized and define goals and results[5], in addition to helping the health professional understand the context in which individuals are inserted, recognizing the influence of contextual factors on the health condition, thus improving care interventions.

Therefore, this work aimed at constructing and validating a physical therapy evaluation tool and a functional classification based on the ICF for members of the HIV community hospitalized in the infectious diseases sector of a university hospital.

METHODOLOGY

Study design

This is a cross-sectional, observational and descriptive study[15] and was conducted in the infectious disease sector of a university hospital in the city of Curitiba (PR).

Study stages

The first stage consisted of identifying the need for a specific instrument for user evaluation and literature search in the PEDro, Science Direct, and PubMed databases, in a complementary way. The keywords "HIV," "CIF," and "*Serviço Hospitalar de Fisioterapia*" were used.

In the second stage, the first version of the evaluation form (Form 1) was constructed in a broad and organized way, according to the BPS parameters of the ICF components. From the health status (HIV infection), the following items were investigated: patient's general condition; eating and respiratory status; pain; strength; muscle trophism; and the motor function condition of the participant in bed, sitting, during orthostasis, and walking. The functional independence measure (FIM) was used to verify the individual's activities and participation.

Environmental factors are external to the person and can act as barriers or facilitators, including origin, housing, access to health services, support network, and previous hospitalizations, among others.

Personal factors cannot be classified, but interact with each other and contribute to the results of interventions. Demographic data, life habits, risk behavior, HIV diagnosis and evolution, and use of antiretroviral medicines were collected, and the translated HIV-AIDS quality of life (HAT-QoL) questionnaire was used.

In the third stage of the study, Form 1 was applied to 15 participants as a pilot. The inclusion criteria were individuals diagnosed with HIV, hospitalized in the infectious diseases sector, of both genders, over 18 years, and who signed the informed consent form for participation in the study. The cases of patients unable to answer about themselves or to perform the tests (restricted to bed, cognitive deficit) were included after the authorization of the guardians.

Data collection also involved research in medical records and the evaluation time was quantified to verify the feasibility of the application in the sector.

In the fourth stage, after analyzing the relevance of the issues addressed and the time of application, there was inclusion and exclusion of items and the form was restructured to a reduced version (Form 2) that included the codes and qualifiers of the ICF. The search for the categories and codes used was performed in the online version of the ICF[13]. Personal factors were used only descriptively.

In the fifth stage, the expert committee, composed of hospital physical therapists and experts in working with the ICF, were consulted. The participants were previously invited to participate in this stage and, after accepting, they were sent Form 2, the online version of the ICF[13], and an evaluation instrument developed specifically for this stage.

To characterize the evaluators' sample, the following questions were asked: age, time of education and specialization, practice in the care of people living with HIV, and knowledge and experience regarding the use of the ICF. Next, they were instructed to answer, by means of a dichotomous scale, whether or not they agree with the suggested version, checking what categories and codes were sufficiently contemplated, answering about the equivalence and relevance of all items and having a space for suggestions, according to Chart 1. All pertinent suggestions made by the experts were accepted after review by the study team.

Chart 1. Expert evaluation example

VERSION	FUNCTIONS AND STRUCTURES OF THE BODY – State of Consciousness		
F1	*Conscious patient*		
F2	*State of consciousness b1100__*		
SUGGESTED VERSION	*Conscious patient b1100__*		
1. Do you agree with the NEW SUGGESTED VERSION?		YES ( )	NO ( )
2. Equivalences	–1 (not equivalent)	0 (not possible to evaluate / Do not know)	+1 (equivalent)
Suggestions:			
3. Do you consider this item relevant?		YES ( )	NO ( )

The sixth stage was validation. The validity of this instrument involved two types of validation: content and construct. Content validation is the analysis and judgment of the instrument by the expert committee who evaluated each item for content and relevance of investigation. The construct validity, in turn, aims at the reliability of the instrument and of each item analyzed by statistical tests, as described in the next stage.

In the seventh stage, the analysis, the data were tabulated and analyzed using the software R v4.0.0. As a descriptive measure of agreement, the modal value was calculated and the percentage was obtained in relation to the group of six evaluators. The calculation of the kappa coefficient was implemented by means of the irr v.0.84.1 package, being calculated for each question and for the set of all questions of the instrument. Kappa values were classified as: minimal, poor, moderate, strong, and almost perfect agreement[16]. The significance level adopted was $p<0.05$.

The eighth stage consisted of producing the final version (Form 3), adjusting the instrument according to the suggestions, including only the questions and their respective codes that obtained kappa coefficient ≥0.80 in the sixth stage, the agreement value considered strong or almost perfect among the specialists.

In the last stage, Form 3 was completed and presented to the physical therapists responsible for the hospital's infectious diseases sector.

RESULTS

Contextual factors (housing, support network, and access to medicines) were found to interfere in the aspects of human functionality, but until the beginning of the study they were not quantified due to the lack of an adequate instrument for this.

The search for literature with the combination of the chosen descriptors obtained few results. When searched separately, the number of articles found was higher, especially using the ICF as a keyword, but the results were of little relevance to the proposed topic.

The third stage included a sample of 15 individuals, six females (40%) and nine males (60%), and 42.6 years as the mean age (13.92 standard deviation). The mean evaluation time was 20.4 minutes (3.06 standard deviation). The evaluations allowed the analysis of the time, content and issues addressed. The restructuring to the reduced version (Form 2) was made considering the inclusion and exclusion of items and integration of the CIF codes, as Chart 2 shows.

Form 2 was forwarded to the experts committee. The invitation was sent to 12 physical therapists, but only six (50%) returned the answered instrument within the established deadline.

The sample consisted of physical therapists of both genders, mostly male (66.66%), aged 23 to 53 years, as Table 1 shows.

In total, 58 items and their respective classification codes were evaluated. The analysis by the experts resulted in 0.858 overall kappa value, representing strong agreement between the evaluations, all being statistically significant with $p<0.05$. Table 2 shows the result.

For the preparation of Form 3, only the items with strong or almost perfect agreement according to the kappa index (>0.80) were included. There were no situations of no or minimal agreement. The final version was completed and presented to the physical therapists responsible for the infectious disease sector for application in the service after training the professionals.

Chart 2. Restructuring of Form 2

Component	Items	Form 1	Form 2
Health condition	ICD, admission diagnosis, main complaint	absent	X
Body functions and structures	Consciousness, orientation	X	X
	Vital signs	X	absent
	Sleep functions in quantity and quality	both	only quality
	Emotional functions	X	X
	Body image	X	X
	Feeding	X	X
	Immune system functions and viral load	X	X
	Cardiorespiratory functions and fatigue	X	X
	Motor function condition presented	X	X
	Muscle tone	X	X
	Joint mobility	absent	X
	Muscle strength (MRC)	X	X
	Sarcopenia evaluation (SARC-F + calf circumference)	X	absent
	Gait type	absent	X
	4-meter gait evaluation	X	absent
Activity and participation	Communication; evaluation of mobility in bed, sitting, during orthostasis, during transfers and ambulation (with and without auxiliary devices); functional independence measure (FIM)	X	X
Environmental factors	Origin; lives alone, with relatives, on the street, in a shelter; number of previous hospitalizations; follow up in the infectious disease outpatient clinic and with a multidisciplinary team; has access to ART	X	X
	Presence of support network (family, friends, acquaintances, and health services)	absent	X
Personal factors	Name, age, gender, sexual orientation, marital status, occupation, income, education, time of HIV diagnosis, confidentiality of diagnosis, form of transmission, time of ART use, lifestyle habits, presence of associated diseases	X	X
	HAT-Qol Questionnaire	X	absent

ICD: International Classification of Diseases; HAT-QoL: HIV-AIDS quality of life; MRC: Medical Research Council; ART: antiretroviral therapy.

Table 1. Sample characterization – experts committee

Sample characterization – Expert committee		
Description	**Value**	**% of total**
Experts – hospital area	4	66.67
Experts – CIF area	2	33.33
Mean age (years)	36	-
Mean training time (months)	143.7	-
Specialization degree	4	66.67
Work in hospitals	5	83.33
Mean time working in hospitals (months)	59.8	-
Knowledge about the ICF	6	100
Knowledge about the application of the ICF	3	50

ICF: International Classification of Functioning, Disability and Health.

Table 2. Analysis of general agreement between evaluators

Component	Domain	Category	Kappa coefficient	Agreement
Body functions	Global mental functions	b1100 State of consciousness	1	Perfect
		b1140 Orientation to time	1	Perfect
		b1141 Orientation to place	1	Perfect
		b1142 Orientation to person	1	Perfect
		b117 Intellectual functions	0.783	Moderate
		b1343 Quality of sleep	0.687	Moderate
	Specific mental functions	b144 Memory functions	1	Perfect
		b1522 Range of emotion	1	Perfect
	Experience of self and time functions	b1801 Body image	0.687	Moderate
	Pain	b280 Sensation of pain	1	Perfect
		b2800 Generalized pain	0.783	Moderate
		b2801 Pain in body part	0.783	Moderate
	Functions of the haematological and immunological systems	b435 Immunological system functions	1	Perfect
		b43500 Specific immune response	1	Perfect
	Functions of the respiratory system	b440 Respiration functions	1	Perfect
	Exercise tolerance functions	b4552 Fatiguability	1	Perfect
	Additional functions and sensations of the cardiovascular and respiratory systems	b460 Sensations associated with cardiovascular and respiratory functions	1	Perfect
	Functions related to the digestive system	b515 Digestive functions	0.586	Poor
		b530 Weight maintenance functions	1	Perfect
	Functions of the joints and bones	b7100 Mobility of a single joint	1	Perfect
		b7102 Mobility of joints generalized	1	Perfect
	Muscle functions	b730 Muscle power functions	1	Perfect
		b7300 Power of isolated muscles and muscle groups	1	Perfect
	Muscle tone functions	b735 Muscle tone functions	0.443	Poor
	Movement functions	b770 Gait pattern functions	1	Perfect
Body structures	Structures of the cardiovascular, immunological and respiratory systems	s430 Structure of respiratory system	1	Perfect
Activities and participation	Communication	d310 Communicating with - receiving - spoken messages	1	Perfect
		d315 Communicating with - receiving - nonverbal messages	0.443	Poor
		d329 Communicating - receiving, other specified and unspecified	1	Perfect
		d349 Communication - producing, other specified and unspecified	1	Perfect
	Learning and applying knowledge	d175: Solving problems	0.783	Moderate
	Mobility	d410 Changing basic body position	1	Perfect
		d415 Maintaining a body position	1	Perfect
		d420 Transferring oneself	1	Perfect
		d4200 Transferring oneself while sitting	1	Perfect
		d450 Walking	1	Perfect
		d4551 Climbing	1	Perfect
		d4559 Moving around, unspecified d460 Moving around in different locations	0.766	Moderate
		d4600 Moving around within the home	0.474	Poor
		d465 Moving around using equipment	1	Perfect
	Self-care	d510 Washing oneself	0.783	Moderate
		d520 Caring for body parts	0.783	Moderate
		d530 Toileting	0.783	Moderate
		d5300 Regulating urination	0.783	Moderate
		d5301 Regulating defecation	0.783	Moderate
		d540 Dressing	0.783	Moderate
		d550 Eating	1	Perfect
		d560 Drinking	1	Perfect
	Acquisition of necessities	d610 Acquiring a place to live	1	Perfect
	Interpersonal interactions and relationships	d710 Basic interpersonal interactions	0.783	Moderate
		d720 Complex interpersonal interactions	0.783	Moderate

(continues)

Table 2. Continuation

Component	Domain	Category	Kappa coefficient	Agreement
Environmental factors	Products or substances for personal consumption	e1101 Drugs	1	Perfect
	Support and relationships	e310 Immediate family	1	Perfect
		e320 Friends	0.766	Moderate
		e325 Acquaintances, peers, colleagues, neighbours and community members	0.432	Poor
		e355 Health professionals	0.687	Moderate
	Housing services, systems and policies	e5250 Housing services	1	Perfect
	Health services, systems and policies	e5800 Health services	1	Perfect

DISCUSSION

This study identified the most relevant ICF categories to the care of hospitalized members of the HIV community from the perspective of physical therapists and using a consensus methodology. The BPS approach to functionality is an advantage of using the ICF when compared to other instruments, given the language structured in codes, enabling effective and universal communication among the multidisciplinary team[17].

Given the variability and complexity of the clinical and functional picture of people living with HIV or AIDS, health services face a challenge in offering comprehensive care, which investigates the clinical and contextual repercussions[18]. Considering the advance of antiretroviral therapy and its availability in the health system, the incidence of the disease in recent years, and the life expectancy of HIV-positive patients, a new look at HIV and the public policies that guide and enable its prevention and care becomes necessary[19].

Data collection using the ICF constitutes an important conceptual basis for the evaluation and formulation of actions and public policies for health and disability[20]. Other authors suggest using the ICF in people living with AIDS may be valid to identify the origin and relevance of their clinical, social, and personal context, so intervention programs and policies aimed at them can be adjusted[21-23].

Despite being an adequate instrument to identify the BPS aspects involved in patients' health conditions and rehabilitation processes, the application of the ICF in clinical practice remains quite limited[24-26]. The lack of knowledge of physical therapy professionals regarding its use and the time spent for its application is one of the limiting factors[26,27]. In this study, although all the specialist physical therapists were familiar with the ICF, only half had experience applying it.

The literature review by Castaneda, Bergmann and Bahia[17] verified the ICF use in observational studies, identifying a gap in quantitative content about clinical practice, and most publications addressed the concepts and reinforced the importance of its implementation in the health field. According to them, the difficulty of use in clinical practice occurs because the classification does not indicate what instruments are necessary for evaluating disability and functionality. Given the relevance of the topic, developing physical therapy assessment and functional classification instruments based on the ICF BPS model for hospitalized HIV-positive patients is necessary to establish a tool based on the patient's individuality and aimed to produce quantitative data.

The study by Paschoal et al.[5] was the first to identify the main ICF codes and categories for hospital physical therapy practice in Brazil. As in this study, the authors used a consensus methodology with physical therapists and highlighted the function and activities of the musculoskeletal system as the main objectives of this professional's interventions in all stages of rehabilitation in hospitals and other environments.

The proposal for a core set for people living with AIDS produced by Buchalla and Cavalheiro[21] contemplated 40 conditions considered relevant. The authors indicated the categories of body image, digestive functions, functions of general metabolism, and weight maintenance as the most frequent. Issues regarding life situation, body image, sexual functions, and intimate relationships were also addressed. In general, the selection of categories in the core set is unlike this study, in which global mental functions, activity issues, and participation regarding mobility and self-care were highlighted. These differences can be justified mainly by the perception of patients versus that of the professionals who attend to them in the hospital environment. Both studies included environmental factors as a relevant condition due to

their facilitator or barrier function on the individual's functionality and participation[5,21].

Furthermore, it should be noted that the present study used purposive sampling in the expert committee to meet the objective of involving a sample of professionals that was representative for its work in the hospital environment and care to HIV patients, as well as for its expertise in working with the ICF. However, only six experts participated in the consensus, resulting in a sample loss of 50% between the invitation and the return of the answers to the questionnaires, contributing to the literature data[28].

Besides the small number of physical therapists who comprised the committee, the study's limitations include the scarce literature on the subject to discuss the results, the time it took to apply the instrument, and the skills and knowledge needed by the professional for the correct use of the tool. Another limitation is the gap in the use of systematized and validated instruments that indicate the BPS advances and practices in the different environments in which the physical therapist works, from promotion to hospital care, considering functional potentials and improvements with appropriate clinical prescriptions of the professional practice for the benefit of different users of the Unified Health System (SUS).

Given the variability and complexity of the clinical and functional picture of people living with HIV, health services face a challenge in offering comprehensive care, investigating clinical data and contextual impacts (social, emotional, and personal). In the hospital, the application of the ICF BPS model may be useful considering the recurrent hospitalizations, as it allows the investigation of the health status of individuals in different stages and contexts. The instrument produced in this study is a powerful tool in the clinical practice of physical therapy, given its simple application and objectives, such as the functional comparison between the different periods a given individual was hospitalized and the promotion of health with the planning of hospital discharge considering the biopsychosocial aspects involved.

CONCLUSION

The instrument constructed and named "*Avaliação Funcional Fisioterapêutica de Saúde para Pessoas com HIV*" (AFFIS-HIV) is valid for physical therapy assessment and ICF-based functional classification for hospitalized HIV-positive patients. Its use will contribute to clinical practice as an advantageous and simple tool for evaluating the functionality and planning of physical therapy care, considering the biopsychosocial context of seropositive people in a hospital environment.

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