



UNIVERSIDADE D  
COIMBRA

FACULDADE  
DE  
MEDICINA

MESTRADO INTEGRADO EM MEDICINA – TRABALHO FINAL

RAQUEL JUDITE PINTO E SILVA

***PRISMA-7 scale translation and adaptation to spoken  
Portuguese in Europe***

ARTIGO CIENTÍFICO ORIGINAL

ÁREA CIENTÍFICA DE MEDICINA GERAL E FAMILIAR

Trabalho realizado sob a orientação de:  
PROFESSOR DOUTOR LUIZ MIGUEL SANTIAGO

SETEMBRO/2019

***PRISMA-7 scale translation and adaptation to spoken  
Portuguese in Europe***

***Tradução e adaptação da escala PRISMA-7 para o  
Português falado na Europa***

Raquel Judite Pinto e Silva<sup>1</sup>

Luiz Miguel Santiago<sup>1,2</sup>

<sup>1</sup>Faculty of Medicine, University of Coimbra, Portugal

<sup>2</sup>Head of the General Practice/Family Medicine Clinic of the Faculty of Medicine, University of Coimbra, Portugal

Contact: raquel.pintosilva@gmail.com

## **Abstract**

Introduction: Frailty is an age-associated biological syndrome and a predictor of multimorbidity outcome whose early recognition allows the identification of those older patients at risk. The PRISMA-7 scale allows the identification of frail elderly people.

Methods: Cross-cultural adaptation by translation of the PRISMA-7 scale into European Portuguese, debriefing and back-translation to English. Application for intra-observer reliability assessment and validation by simultaneous and concurrent application of the Katz scale.

Results: The Cronbach's alpha coefficient was of 0.420 and 0.409 after retest. Spearman's Rank Order Correlation of 0.969 in the retest operation in a purposive sample of 64 elderly people (35 female). More than 3 affirmative answers were found for older ones ( $p < 0.001$ ), higher number of self-reported drugs ( $p = 0.001$ ) and for lower self-reported years of education ( $p = 0.001$ ), in the validation of the translated PRISMA-7 scale, in a purposive sample of 127 elderly people, 72 (56.7%) female. No differences were found between gender ( $p = 0.414$ ) and for number of self-reported diseases ( $p = 0.258$ ). A Spearman correlation of  $\rho = 0.477$  ( $p < 0.001$ ) between the total of the two scales was found.

Discussion: This comprehensive tool enables health care providers to discuss and architect more effective and efficient measures for these patients' care, regardless of gender, sociodemographic factors, number of self-reported drugs and diseases.

Conclusion: PRISMA-7 scale is now recommended to identify frail elderly in the Portuguese community.

**Keywords:** Frailty, frail elderly, disease, general practice.

## 1. Introduction

The ageing population poses new challenges for health and social care services [1-6]. The increase in life expectancy is inversely associated with healthy life expectancy, implying longer lifespan with disability and, therefore, increased use of health care, multi-morbidity and frailty [2,7]. The group of frail older people is increasing due to ageing and increase in life expectancy [6]. A high percentage of emergency patients are frail older patients and they are the fastest growing group in primary care [6,8,9].

Frailty is an age-associated biological syndrome with multisystem down-dysregulation, reduced physiological reserves [7-11] and capacity to maintain homeostasis [1,12-17], loss of cognitive function [18], functional decline [5,6], increased risk of being institutionalized [19] and vulnerability to stressors [9-11,13-15,20], risk of falls, disability, dependence [4,18], activity limitations, imminent death, hospitalization, prolonged recovery and relapse [1,8,16,19,21-25]. Frail older patients present a long clinical course of disease with intermittent episodes of decline and experience a lack of coping strategies when dealing with change and disruptions [2,19]. Very old patients evaluate their health problems based on impact [26]. Interactions between physiological changes due to ageing, polypharmacy, multimorbidity and functional impairment are often complex [21].

Frailty is more prevalent in developing countries and is associated with sociodemographic variables, such as gender and age [14]. The incidence of frailty increases with age, lower education and income, poor health, multimorbidity, disability and is higher in women and in Afro-Americans [11].

A high percentage of frail older patients is treated in specialized acute care units suffering from multimorbidity and recurrent acute illnesses [5,6,8,21]. After discharge, older patients have a higher risk of mortality and approximately one-third of older patients experience a loss of independence in self-care activities, including personal and instrumental activities of daily living, which are related with poor nutrition, insufficient continence and care and low mobility during hospitalization [18,21]. Functional decline is associated with worst outcomes of health-related quality of life, less living at home, more re-hospitalizations and higher health costs, which result in the use of more expensive and intensive services and higher mortality [18,21,27].

Frailty is a predictor and an outcome of multimorbidity, needing to be early diagnosed [1,23]. Functional status assessment in geriatric practice is important for early diagnosis as it has implications in prognosis, as well as in optimizing care, planning interventions and preventing progression of frailty [17,18,23,28].

Several frailty instruments evaluate weakness, slowness, low physical activity, unintentional weight loss, accumulation of deficits and exhaustion, which are aspects of the clinical phenotype of frailty that should be diagnosed with no delay [8-10,13,14,16,21-24,27].

Comprehensive geriatric assessment, treatment and rehabilitation is associated with decreased mortality, less functional decline at discharge, reduced care needs and a higher probability of living at home [3,5,8,13,21]. So and to prevent hospitalization adequately, we need to study ambulatory older people with an adequate instrument to prevent delay of functional decline [29].

The Program on Research for Integrating Services for the Maintenance of Autonomy (PRISMA) was developed in Canada in 2005 [29]. The PRISMA model includes the PRISMA-7 questionnaire, validated to screen for frailty, associated to a management system, which allows services to be adapted to clients' needs [29,30]. PRISMA-7 identifies risk factors for functional decline through seven dichotomous items [29,31]. In the Canadian study, PRISMA-7 had 78% of sensitivity and 75% of specificity with a cut-off point of three or more positive answers for identification of functional decline in older patients and 61% of sensitivity and 91% of specificity with a cut-off point of four or more positive answers [30]. Due to the good performance of PRISMA-7 in comparison with other frailty assessment instruments, the Royal College of General Practitioners and the British Geriatrics Society recommend PRISMA-7 for frailty identification [29,31].

The Katz scale is the index of independence in daily life activities developed by Sidney Katz and is one of the mostly used instruments in geriatric evaluation [32]. The scale measures hierarchically related activities of daily living and allows the evaluation of independence in the execution of six daily life functions [32]. The Katz scale allows monitoring of the evolution of disability through ageing, as well as of the prognosis, intervention planning and evaluation of the effectiveness of performed treatments [32].

Daily life activities are influenced by one's culture and determined behavior, cultural norms and values making cross-cultural validation of scales important in research [28].

This study aims to make the cross-cultural adaptation and validation of the PRISMA-7 scale, assessing its psychometric properties concurrently with another well-known health related scale, the Katz scale.

## **2. Methods**

The study's first phase was the cross-cultural adaptation and semantic equivalence PRISMA-7 scale so it was translated from English [30] to European Portuguese. The original English scale consists of seven dichotomous questions, since the intended answer is a yes or no response, as showed in Table I.

**Table I:** PRISMA-7's original English version [30].

Questions	Answer	
	Yes	No
P1: Are you older than 85 years?	<input type="checkbox"/>	<input type="checkbox"/>
P2: Are you male?	<input type="checkbox"/>	<input type="checkbox"/>
P3: In general, do you have any health problems that require you to limit your activities?	<input type="checkbox"/>	<input type="checkbox"/>
P4: Do you need someone to help you regularly?	<input type="checkbox"/>	<input type="checkbox"/>
P5: In general, do you have any health problems that require you to stay at home?	<input type="checkbox"/>	<input type="checkbox"/>
P6: If you need help, can you count on someone close to you?	<input type="checkbox"/>	<input type="checkbox"/>
P7: Do you regularly use a cane, a walker, or a wheelchair to move about?	<input type="checkbox"/>	<input type="checkbox"/>

The translation was made by two people, fluent in technical English language whose mother tongue is Portuguese. This translation was then retranslated into English by a bilingual Portuguese/English teacher, who did not have any information about the concepts and objectives of the questionnaire. The purpose of the retranslation was to verify the popular use of the source language and to correct any ambiguous meanings of the original questionnaire. Then a debriefing was made, by three Medical Doctors, to verify the accordance of the Portuguese wording to the English sentences. Table II shows the PRISMA-7's final version.

**Table II:** PRISMA-7's European Portuguese final version.

Questões	Resposta	
	Sim	Não
P1: Tem mais de 85 anos?	<input type="checkbox"/>	<input type="checkbox"/>
P2: É do sexo masculino?	<input type="checkbox"/>	<input type="checkbox"/>
P3: Em geral, tem algum problema de saúde que o/a obrigue a diminuir ou limitar as suas atividades?	<input type="checkbox"/>	<input type="checkbox"/>
P4: Precisa da ajuda de alguém regularmente?	<input type="checkbox"/>	<input type="checkbox"/>
P5: Em geral, tem algum problema de saúde que o/a obrigue a ficar em casa?	<input type="checkbox"/>	<input type="checkbox"/>
P6: Se precisar de ajuda, tem alguém próximo para o/a ajudar?	<input type="checkbox"/>	<input type="checkbox"/>
P7: Utiliza regularmente bengala, andador ou cadeira de rodas?	<input type="checkbox"/>	<input type="checkbox"/>

Subsequently, in the second phase of the study, the Portuguese version of the PRISMA-7 scale was applied in two different moments to evaluate the scale's intra-observer reliability (test-retest). An epidemiological scale was simultaneously applied in the first moment. Both scales were self-administered, with the guarantee of anonymity and confidentiality, after informed consent to persons older than 64 years, of whom 35 were female, selected from the ambulatory care in the island of São Miguel, Azores, and in Portugal central mainland in the city of Coimbra. For test-retest reliability analysis,

Chronbach's alpha coefficient was used and Spearman's Rank Order Correlation to calculate the strength of the relationship between the results obtained in the two different moments. The Mann-Whitney U Test was used to test differences between the results obtained in the two different moments and the Chi-square test for Independence was used to explore the relationship between sociodemographic variables [33]. We also performed a study on the level of literacy and the perceptibility of the scale.

The study's third phase aimed to validate the PRISMA-7 scale with the Katz scale. The questionnaire was applied to 127 older people in the same health units. Simultaneously an epidemiological scale was also self-administered, guaranteeing anonymity and confidentiality after informed consent. For results' analysis the Mann-Whitney U Test was used to test for differences between sociodemographic variables and the number of affirmative answers in the PRISMA-7 scale, Pearson's correlation was used to explore the strength of the relationship between PRISMA-7 and the Katz scale and the Chi-square test for Independence was used to explore the relationship between sociodemographic variables. A  $p < 0.001$  value was used to address statistical difference [33] and a cut-off value of three affirmative answers was defined for study use. The presence of three or more affirmative answers will allow the diagnosis of frailty.

### **3. Results**

The study's first, cross-cultural adaptation and semantic equivalence were successfully achieved.

Regarding the study's second phase, Table III shows the sociodemographic characteristics of the purposive phase 2 sample of 64 older people, of whom 35 (54.7%) were female. Women were older than men, reported more simultaneous diseases and medications and had less years of education. These last three items showed statistical difference.

**Table III:** Sociodemographic statistics for the study's second phase.

			Gender		Total
			Male	Female	
Age p=0.127	65-75 years	Count	15	12	27
		Gender %	51.7%	34.3%	42.2%
	76-85 years	Count	3	3	6
		Gender %	10.3%	8.6%	9.4%
	Equal or greater than 86 years	Count	11	20	31
		Gender %	37.9%	57.1%	48.4%
Number of self-reported diseases p<0.001	Up to 2 diseases	Count	21	11	32
		Gender %	72.4%	31.4%	50.0%
	3 to 4 diseases	Count	6	11	17
		Gender %	20.7%	31.4%	26.6%
	4 to 6 diseases	Count	1	8	9
		Gender %	3.4%	22.9%	14.1%
	Greater than 6 diseases	Count	1	5	6
		Gender %	3.4%	14.3%	9.4%
Number of self-reported drugs p<0.001	Up to 2 drugs	Count	8	1	9
		Gender %	27.6%	2.9%	14.1%
	3 to 4 drugs	Count	9	6	15
		Gender %	31.0%	17.1%	23.4%
	4 to 6 drugs	Count	6	12	18
		Gender %	20.7%	34.3%	28.1%
	Greater than 6 drugs	Count	6	16	22
		Gender %	20.7%	45.7%	34.4%
Number of self-reported years of education p<0.001	Less than 4 years	Count	4	19	23
		Gender %	13.8%	54.3%	35.9%
	4 years	Count	20	14	34
		Gender %	69.0%	40.0%	53.1%
	7 years	Count	5	1	6
		Gender %	17.2%	2.9%	9.4%
	Greater than 7 years	Count	0	1	1
		Gender %	0.0%	2.9%	1.6%
<b>Total</b>		Count	29	35	64
		Gender %	100.0%	100.0%	100.0%

Table IV shows the assessment of internal consistency and the strength of the relationship between the results obtained in the two different moments. Cronbach's alpha coefficient presented a test value of 0.420 and a retest value of 0.409 and Spearman's Rank Order Correlation (rho) presented a test value of 1.000 and a retest value of 0.969.

**Table IV:** Test and retest reliability statistics for the study's second phase.

Test reliability statistics		Retest reliability statistics		Spearman's rho in test-re-test	
Cronbach's alfa coefficient	Number of items	Cronbach's alfa coefficient	Number of items	Test	Retest
0.420	7	0.409	7	1.000	0.969**



Table V shows the assessment of internal consistency for each item applied in the two different moments based on Cronbach's alpha coefficient, scale mean and variation and corrected item total correlation. All items had 64 answers, except for items 1 and 3, which had 63 answers. Item 6 had the lowest scale mean in the test and the retest (1.0938 and 1.1094, respectively). Item 7 had the highest mean in the test and the retest (1.6563 and 1.6406, respectively). Items 1, 3 and 5 had the lowest difference in the scale variation between test and retest. Item 6 had the highest difference in the scale variation in test and retest. Cronbach's alpha coefficient varied between 1.000 and 0.906 (items 1 and 4, respectively). Perceptibility by the Flesher instrument was 75.11, meaning the scale was relatively easy to understand.

**Table V:** Items statistics for the study's second phase.

Item	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Reliability statistics	
				Cronbach's alfa coefficient	Number of items
P1	1.5156	0.254	1.000	1.000	2
P1.1	1.5156	0.254	1.000		
P2	1.3906	0.242	0.937	0.968	2
P2.1	1.4219	0.248	0.937		
P3	1.2698	0.200	0.919	0.958	2
P3.1	1.2698	0.200	0.919		
P4	1.4531	0.252	0.906	0.951	2
P4.1	1.4688	0.253	0.906		
P5	1.5000	0.254	0.969	0.984	2
P5.1	1.4844	0.254	0.969		
P6	1.0938	0.086	0.918	0.956	2
P6.1	1.1094	0.099	0.918		
P7	1.6563	0.229	0.966	0.983	2
P7.1	1.6406	0.234	0.966		

For the study's third phase, Table VI shows the socio-demographic characteristics of the purposive sample. We found no differences by gender for the studies variables.

**Table VI:** Sociodemographic statistics for the study's third phase.

			Gender		Total
			Male	Female	
Age p=0.360	65-75 years	Count	27	30	57
		Gender %	49.1%	41.7%	44.9%
	76-85 years	Count	16	22	38
		Gender %	29.1%	30.6%	29.9%
	Equal or greater than 86 years	Count	12	20	32
		Gender %	21.8%	27.8%	25.2%
Number of self-reported diseases p=0.192	Up to 2 diseases	Count	24	24	48
		Gender %	43.6%	33.3%	37.8%
	3 to 4 diseases	Count	19	25	44
		Gender %	34.5%	34.7%	34.6%
	4 to 6 diseases	Count	6	15	21
		Gender %	10.9%	20.8%	16.5%
	Greater than 6 diseases	Count	6	8	14
		Gender %	10.9%	11.1%	11%
Number of self-reported drugs p=0.946	Up to 2 drugs	Count	10	12	22
		Gender %	18.2%	16.7%	17.3%
	3 to 4 drugs	Count	13	15	28
		Gender %	23.6%	20.8%	22.0%
	4 to 6 drugs	Count	14	24	38
		Gender %	25.5%	33.3%	29.9%
	Greater than 6 drugs	Count	18	21	39
		Gender %	32.7%	29.2%	30.7%
Number of self-reported years of education p=0.004	Less than 4 years	Count	7	31	38
		Gender %	12.7%	43.1%	29.9%
	4 years	Count	31	26	57
		Gender %	56.4%	36.1%	44.9%
	7 years	Count	7	2	9
		Gender %	12.7%	2.8%	7.1%
	Greater than 7 years	Count	10	13	23
		Gender %	18.2%	18.1%	18.1%
<b>Total</b>		Count	55	72	127
		Gender %	100.0%	100.0%	100.0%

Table VII shows Katz's and PRISMA-7's statistics, class "independence" being the most frequent (n=75, 59.1%) for the Katz Index. For PRISMA-7, 46 (36.2%) of the respondents had three or more positive answers.

**Table VII:** Katz statistics for the study's third phase.

Katz classes	Frequency	Valid percentage
Total dependence	5	3.9%
Severe dependence	4	3.1%
Moderate dependence	12	9.4%
Slight dependence	31	24.4%
Independence	75	59.1%
<b>PRISMA-7</b>		
3 or more affirmative answers	46	36.2%

Table VIII shows the distribution of the results on the Katz scale according to the three affirmative answers cut-off on the PRISMA-7 frailty scale. We found a statistically significant association between the level of dependence and the diagnosis of frailty ( $p < 0.001$ ). We also found a Spearman correlation of  $p = 0.477$  ( $p < 0.001$ ) between the total of the two scales.

**Table VIII:** PRISMA-7 and Katz statistics for the study's third phase.

			PRISMA-7 (*)		Total	
			3 or more affirmative answers	Less than 3 affirmative answers		
Katz	Total dependence	Count	5	0	5	
		Percentage	10.9%	0.0%	3.9%	
	Severe dependence	Count	4	0	4	
		Percentage	8.7%	0.0%	3.1%	
	Moderate dependence	Count	8	4	12	
		Percentage	17.4%	4.9%	9.4%	
	Slight dependence	Count	16	15	31	
		Percentage	34.8%	18.5%	24.4%	
	Independence	Count	13	62	75	
		Percentage	28.3%	76.5%	59.1%	
	<b>Total</b>		Count	46	81	127
			Percentage	100.0%	100.0%	100.0%

(\*) $p < 0.001$

Table IX shows PRISMA-7 classes and sociodemographic statistics for the study's third phase. There were more individuals with less than 3 affirmative answers (81, 63.8%). In the group of the frail individuals (3 or more affirmative answers on the PRISMA-7 scale), we found more women (54.3%, ns), more people from the oldest age group (52.2%,  $p < 0.001$ ), more self-reported multimorbidity, with 4 or more diseases (34.8%, ns), more self-reported medicines, taking 4 or more drugs (73.9%, ns), and less education, 4 or less years (86.9%, ns).

**Table IX:** PRISMA-7 classes and sociodemographic statistics for the study's third phase.

			PRISMA-7 (*)		Total
			3 or more affirmative answers	Less than 3 affirmative answers	
Gender p=0.414	Male	Count	21	34	55
		Percentage	45.7%	42.0%	43.3%
	Female	Count	25	47	72
		Percentage	54.3%	58.0%	56.7%
Age p<0.001	65-75 years	Count	11	46	57
		Percentage	23.9%	56.8%	44.9%
	76-85 years	Count	11	27	38
		Percentage	23.9%	33.3%	29.9%
	Equal or greater than 86 years	Count	24	8	32
		Percentage	52.2%	9.9%	25.2%
Number of self-reported diseases p=0.258	Up to 2 diseases	Count	15	33	48
		Percentage	32.6%	40.7%	37.8%
	3 to 4 diseases	Count	15	29	44
		Percentage	32.6%	35.8%	34.6%
	4 to 6 diseases	Count	11	10	21
		Percentage	23.9%	12.3%	16.5%
	Greater than 6 diseases	Count	5	9	14
		Percentage	10.9%	11.1%	11.0%
Number of self-reported drugs p=0.001	Up to 2 drugs	Count	3	19	22
		Percentage	6.5%	23.5%	17.3%
	3 to 4 drugs	Count	9	19	28
		Percentage	19.6%	23.5%	22.0%
	4 to 6 drugs	Count	12	26	38
		Percentage	26.1%	32.1%	29.9%
	Greater than 6 drugs	Count	22	17	39
		Percentage	47.8%	21.0%	30.7%
Number of self-reported years of education p=0.001	Less than 4 years	Count	22	16	38
		Percentage	47.8%	19.8%	29.9%
	4 years	Count	18	39	57
		Percentage	39.1%	48.1%	44.9%
	7 years	Count	2	7	9
		Percentage	4.3%	8.6%	7.1%
	Greater than 7 years	Count	4	19	23
		Percentage	8.7%	23.5%	18.1%
<b>Total</b>		Count	46	81	127
		Percentage	100.0%	100.0%	100.0%

#### 4. Discussion

According to prior studies for cross-cultural adaptation and validation, the internal consistency assessed by Cronbach's alpha coefficient showed a borderline value, probably because of the length of the questionnaire. It should be highlighted that this scale is more of an objective matrix registry than a scale measuring intrinsic variable subjective values about someone's opinion on a particular subject.

In the evaluation of the internal consistency of the test, Sanguer *et al.* [29] obtained a Cronbach's alpha coefficient value of 0.619, which is higher than that obtained in this study (Cronbach's alpha coefficient of 0.420). This difference may be due to differences in sample size and intrinsic characteristics. The study of Sanguer *et al.* [29] does not present the value of the Cronbach's alpha coefficient for the retest.

This is a valid European Portuguese version of the PRISMA-7 scale which is easy to understand.

In the second phase of the study, the Cronbach's alpha coefficient denotes internal consistency and reliability and the Spearman's Rank Order Correlation indicates a positive association between the results obtained in the test and retest of the translation of the PRISMA-7 scale.

In the third phase of the study, most of the older people interviewed were aged between 65 and 75 years and had 4 years or less of education, therefore a younger population with probable many years to attend primary care health services than older ones. The high number of self-reported drugs taken daily reflected the health status of the older people that access primary health care services.

The identification of frail older with the PRISMA-7 scale was, significantly, in accordance with the classification of functionality of the Katz scale, since for the dependency classifications on the Katz scale there was a higher number of individuals with 3 or more affirmative answers on the PRISMA-7 scale and, simultaneously, for the independence classification on Katz scale there was a higher number of individuals with less than 3 affirmative answers on the PRISMA-7 scale.

In both genders there were similar percentages of 3 or more affirmative responses indicating that the PRISMA-7 scale allows the identification of frail older people regardless of gender.

The PRISMA-7 scale was sensitive to the sociodemographic factors: an increase in age and in the number of self-reported drugs taken daily was associated with an increase of the number of individuals with 3 or more affirmative answers; a decrease in the number of self-reported diseases was associated with a decrease of the number of individuals with 3 or

more affirmative answers; and an increase in the number of years of education was associated with a decrease of the number of individuals with 3 or more affirmative answers.

As in the study of Sanguer *et al.* [29], the sample of this study had a diversity of sociodemographic characteristics, allowing the evaluation of its applicability in different age groups.

For the PRISMA-7 class of 3 or more affirmative answers, Sanguer *et al.* [29] obtained a higher percentage of individuals in the age group of 60 to 74 years, while in the present study the age group with the highest percentage was the equal or higher than 86 years group. This may be due to differences in cultural characteristics and the time lapse between the two studies. For the educational level and gender, both papers present higher percentage of individuals of the female gender and in the group with less than 4 years of education. These results are in accordance with the risk of greater frailty in these groups.

The results indicate that the PRISMA-7 scale has sensitivity to detect people at risk of frailty between the ages of 65 and 85, so it can be used to identify people at risk of frailty early in this age group, widening the target population for which it is intended. In this way, it will allow the timely implementation of health services with the aim of preventing the emergence of fragility syndrome, contributing to the improvement of the quality of life and increased independence, which consequently will contribute to the reduction of consumption and expenditures of health services.

The PRISMA-7 scale, being specific for the identification of the fragility syndrome, may be an important tool for the follow-up, prognosis and evaluation of the effectiveness of the treatments provided.

In the presence of fragility syndrome, it would be pertinent to verify if the PRISMA-7 scale would also be a useful tool to evaluate caregivers' perception of the person's frailty. Knowledge of caregivers' perceptions could contribute to the early identification of the need for community service support.

## **5. Conclusions**

The results of this study suggest the adequacy of the validation process and the effectiveness in the early identification of frail older patients. The PRISMA-7 version for European Portuguese is a simple, easy to apply and reliable tool for discovering and implementing preventive and rehabilitation health services for old frail people. Therefore, it is recommended as a tool to identify frail older in the community.

## References

1. Bieniek J, Wilczyński K, Szewieczek J. Fried frailty phenotype assessment components as applied to geriatric inpatients. *Clin Interv Ageing* 2016; 11: 453-459, doi: 10.2147/CIA.S101369.
2. Bone AE, Morgan M, Maddocks M, *et al.* Developing a model of short-term integrated palliative and supportive care for frail older people in community settings: perspectives of older people, carers and other key stakeholders. *Age Ageing* 2016 Nov; 45(6): 863-873.
3. Bowman C, Meyer J. Formative care: defining the purpose and clinical practice of care for the frail. *J R Soc Med* 2014; 107(3): 95-98, doi: 10.1177/0141076813512298.
4. Khezrian M, Myint PK, McNeil C, *et al.* A review of frailty syndrome and its physical, cognitive and emotional domains in the elderly. *Geriatrics* 2017; 2(4): 36, doi: 10.3390/geriatrics2040036.
5. Mazya AL, Garvin P, Ekdahl AW. Outpatient comprehensive geriatric assessment: effects on frailty and mortality in old people with multimorbidity and high health care utilization. *Ageing Clin Exp Res* 2019; 31(4): 519-525, doi: 10.1007/s40520-018-1004-z.
6. Muntinga ME, Van Leeuwen KM, Schellevis FG, *et al.* From concept to content: assessing the implementation fidelity of a chronic care model for frail, older people who live at home. *BMC Health Services Research* 2015; 15: 18, doi: 10.1186/s12913-014-0662-6.
7. Comans TA, Peel NM, Hubbard RE, *et al.* The increase in healthcare costs associated with frailty in older people discharged to a post acute transition care program. *Age Ageing* 2016; 45(2): 317-320, doi: 10.1093/ageing/afv196.
8. Ekerstad N, Karlson BW, Ivanoff SD, *et al.* Is the acute care of frail elderly patients in a comprehensive geriatric assessment unit superior to conventional acute medical care? *Clin Interv Ageing* 2017; 12: 1-9, doi: 10.2147/CIA.S124003.
9. Lim WS, Wong SF, Leong I, *et al.* Forging a Frailty-Ready Healthcare System to Meet Population Ageing. *Int J Environ Res Public Health* 2017; 14: 1448, doi: 10.3390/ijerph14121448.
10. Yang F, Gu D. Predictability of frailty index and its components on mortality in older adults in china. *BMC Geriatr* 2016; 16: 145, doi: 10.1186/s12877-016-0317-z.
11. Yeolekar ME, Sukumaran S. Frailty syndrome: a review. *J Assoc Physicians India* 2014; 62: 34-38.
12. Aarts S, Patel KV, Garcia ME, *et al.* Co-presence of multimorbidity and disability with frailty: an examination of heterogeneity in the frail older population. *J Frailty Ageing* 2015; 4(3): 131-138, doi: 10.14283/jfa.2015.45.

13. Chen X, Mao G, Leng SX. Frailty syndrome: an overview. *Clin Interv Ageing* 2014; 9: 433-441, doi: 10.2147/CIA.S45300.
14. Grden CRB, Lenardt MH, Sousa JAV, *et al.* Associations between frailty syndrome and sociodemographic characteristics in long-lived individuals of a community. *Rev Lat Am Enfermagem* 2017; 25: e2886, doi: 10.1590/1518-8345.1770.2886.
15. Lourenço RA. A síndrome de fragilidade no idoso: marcadores clínicos e biológicos. [Fragility syndrome in the elderly: clinical and biological markers]. *Revista HUPE* 2008; 7(1): 21-29 (in Portuguese).
16. Sousa-Santos AR, Afonso C, Moreira P, *et al.* Weakness: The most frequent criterion among pre-frail and frail older portuguese. *Archives of Gerontology and Geriatrics* 2018; 74: 162-168, doi: 10.1016/j.archger.2017.10.018.
17. Wen YC, Chen LK, Hsiao FY. Predicting mortality and hospitalization of older adults by the multimorbidity frailty index. *PLoS One.* 2017; 12(11): e0187825, doi: 10.1371/journal.pone.0187825.
18. Pritchard J M, Kennedy CC, Karampatos S, *et al.* Measuring frailty in clinical practice: a comparison of physical frailty assessment methods in a geriatric out-patient clinic. *BMC Geriatr* 2017; 17(1): 264, doi: 10.1186/s12877-017-0623-0.
19. Brouwers C, Merten H, Willems M, *et al.* Improving care for older patients in the acute setting: a qualitative study with healthcare providers. *Neth J Med* 2017; 75(8): 335-344.
20. Buta BJ, Walston JD, Godino JG, *et al.* Frailty assessment instruments: Systematic characterization of the uses and contexts of highly-cited instruments. *Ageing Res Rev* 2016; 26: 53-61, doi: 10.1016/j.arr.2015.12.003.
21. Ekerstad N, Ivanoff SD, Landahl S, *et al.* Acute care of severely frail elderly patients in a CGA-unit is associated with less functional decline than conventional acute care. *Clin Interv Ageing* 2017; 12: 1239-1249, doi: 10.2147/CIA.S139230.
22. Fried LP, Tangen CM, Walstom J, *et al.* Frailty in older adults: evidence for phenotype. *J Gerontol A Biol Sci Med Sci* 2001; 56(3): M146-156.
23. Hanlon P, Nicholl BI, Jani BD, *et al.* Frailty and pre-frailty in middle-aged and older adults and its association with multimorbidity and mortality: a prospective analysis of 493 737 UK biobank participants. *Lancet Public Health* 2018; 3(7): e323-e332, doi: 10.1016/S2468-2667(18)30091-4.



24. Lana LD, Schneider RH. Síndrome de fragilidade no idoso: uma revisão narrativa. [The frailty syndrome in elderly: a narrative review]. *Rev Bras Geriatr Gerontol* 2014; 17(3): 673-680, doi.org/10.1590/1809-9823.2014.12162 (in Portuguese).
25. Schoenborn NL, Rasmussen SEVP, Xue QL, *et al.* Older adults' perceptions and informational needs regarding frailty. *BMC Geriatr* 2018; 18: 46, doi: 10.1186/s12877-018-0741-3.
26. Münzer T. Medical challenges at the end of the first ten decades of life. *Swiss Med Wkly.* 2017; 147: w14461, doi: 10.4414/smw.2017.14461.
27. Duarte M, Paúl C. Prevalence of phenotypic frailty during the ageing process in a Portuguese community. *Rev Bras Geriatr Gerontol* 2015; 18(4): 871-880, doi.org/10.1590/1809-9823.2015.14160.
28. Arik G, Varan HD, Yavuz BB, *et al.* Validation of Katz index of independence in activities of daily living in Turkish older adults. *Arch Gerontol Geriatr* 2015; 61(3): 344-350, doi: 10.1016/j.archger.2015.08.019.
29. Saenger ALF, Caldas CP, Raïche M, *et al.* Identifying the loss of functional independence of older people residing in the community: Validation of the PRISMA-7 instrument in Brazil. *Arch Gerontol Geriatr* 2018; 74: 62-67, doi: 10.1016/j.archger.2017.09.008.
30. Hébert R, Durand PJ, Dubuc N, *et al.* Frail elderly patients, new model for integrated service delivery. *Can Fam Physician* 2003; 49: 992-997.
31. Saenger ALF, Caldas CP, Mota LB. Adaptação transcultural para o Brasil do instrumento PRISMA-7: avaliação das equivalências conceitual, de item e semântica. [Cross-cultural adaptation of the PRISMA-7 instrument for use in Brazil: evaluation of conceptual, item, and semantic equivalences]. *Cad Saúde Pública* 2016; 32(9): e00072015, doi: 10.1590/0102-311X00072015 (in Portuguese).
32. Duarte YAO, Andrade CL, Lebrão ML. O índice de katz na avaliação da funcionalidade dos idosos. [Katz Index on elderly functionality evaluation]. *Rev Esc Enferm USP* 2007; 42(2): 317-325, doi.org/10.1590/S0080-62342007000200021.
33. Pallant J. *SPSS Survival Manual: A step by step guide to data analysis using SPSS.* Philadelphia: Open University Press; 2005.