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ORIGINAL ARTICLE

EVALUATIVE SCALE CONSTRUCTION OF RISK TO FALLS FOR ELDERLY NON-INSTITUTIONALIZED

CONSTRUÇÃO DA ESCALA AVALIATIVA DO RISCO DE QUEDAS PARA PESSOAS IDOSAS NÃO INSTITUCIONALIZADAS

CONSTRUCCIÓN DE ESCALA EVALUATIVA DE RIESGOS DE CAÍDAS PARA MAYORES NO INSTITUCIONALIZADOS

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ABSTRACT

Objective: building a scale for the assessment of risk factors for falls in older non-institutionalized people. ***Method:*** a study of methodological type, using part of the theoretical procedures of Psychometrics for the construction of measuring instruments. ***Results:*** there were identified 55 major risk factors for falls in older people; being 30 biological, 13 behavioral, four socioeconomic and eight environmental factors related to the inside of the home. These factors constituted the Evaluative Scale of Falls Risk Range (EARQUE); in turn arranged into two sections, being the A section with 32 items and B with 23 a total of 55 items. ***Conclusion:*** EARQUE is characterized as an unprecedented evaluative tool to estimate the risk of falls of the non-institutionalized elderly and could become a useful tool for application in clinical practice and, similarly, in research. ***Descriptors:*** Elderly; Accidental Falls; Risk factors; Community Health Services; Scales.

RESUMO

Objetivo: construir uma escala para avaliação dos fatores de risco para quedas em pessoas idosas não institucionalizadas. ***Método:*** estudo do tipo metodológico, empregando parte dos procedimentos teóricos da Psicometria para a construção de instrumentos de medida. ***Resultados:*** foram identificados 55 fatores de risco principais para quedas em pessoas idosas; sendo 30 biológicos, 13 comportamentais, quatro socioeconômicos e, oito fatores ambientais relacionados com a parte interna do domicílio. Tais fatores constituíram a Escala Avaliativa do Risco de Quedas (EARQUE), por sua vez organizada em duas seções, sendo a seção A com 32 itens e a B com 23, totalizando 55 itens. ***Conclusão:*** a EARQUE se caracteriza como instrumento avaliativo inédito destinado a estimar o risco de quedas na pessoa idosa não institucionalizada e poderá se converter em ferramenta útil para a aplicação na prática clínica e, da mesma forma, na pesquisa. ***Descritores:*** Pessoa Idosa; Acidentes por Quedas; Fatores de Risco; Serviços de Saúde Comunitária; Escalas.

RESUMEN

Objetivo: construir una escala para la evaluación de factores de riesgo de caídas en las personas mayores no institucionalizadas. ***Método:*** es un estudio de tipo metodológico, utilizando parte de los procedimientos teóricos de Psicometría para la construcción de instrumentos de medición. ***Resultados:*** se identificaron 55 principales factores de riesgo de caídas en personas de edad avanzada; siendo 30 biológicos, 13 de comportamiento, cuatro socioeconómico y ocho factores ambientales relacionados con el interior de la casa. Estos factores constituyeron la Escala de Evaluación de Riesgo de Caídas (EARQUE), a su vez dispuestos en dos secciones, siendo la sección A con 32 artículos y B con23, con un total de 55 artículos. ***Conclusión:*** EARQUE se caracteriza como herramienta de evaluación sin precedentes destinada a estimar el riesgo de caídas en las personas mayores no institucionalizadas y podrá convertirse en una herramienta útil para su aplicación en la práctica clínica y, de manera similar, en la investigación. ***Descriptores:*** Ancianos; Caídas Accidentales; Factores de riesgo; Servicios de Salud Comunitaria; Escalas.

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INTRODUCTION

In Brazil, as in other countries, increasing both the number of elderly people as increased longevity brings up discussions of disabling events, including the occurrence of falls in the home.

Fall, while an event linked to aging, contributes to morbidity and mortality in this age group, however can be prevented, representing possibilities of interventions for health professionals and also for researchers. That health promotion scene and prevention of illnesses, health workers require tools that allow them to assess the risk of falls and consequently develop strategies for preventing falls in the elderly. Accordingly, it should be recognized and evaluate the Elder features at risk of falls; as well as those relating to the environment in which they live. And for that, in the context of practical evaluation tools the risk of falls can be useful tools for professionals.

The purpose of using evaluation tools are supported in order to measure certain phenomenon, making it more concrete or tangible, in the case of this study, risk of falls. Although, there is some consensus in the specific scientific literature on risk factors for falls; an extensive clinical evaluation of these factors in the elderly person becomes relevant. Have tools available that span, largely risk factors for falls in the elderly may encourage the multidimensional assessment, enabling more accurate identification of these factors and assertive decision-making with regard to proposals for preventive interventions falls of older people the community; with a view to preserving their quality of life, maintaining their security, not institutionalization and consequently reduced costs for secondary and tertiary care.

Considering the seriousness of the fall phenomenon and to interfere to prevent it, this study aimed to building assessment tool the risk of falls in older non-institutionalized people.

♦ Risk factors of falls in elderly

These can be classified into intrinsic and extrinsic or, more narrowly, in four dimensions: biological, socioeconomic, behavioral and environmental.[1-2] Since, most falls presented by the elderly results from a complex interaction between risk factors, with involvement of the systems involved in maintaining balance.[3-6]

Among the intrinsic risk factors, biological span characteristics of individuals that are relevant to its organization and some of them are not modifiable, for example; gender, age and ethnicity. Biological risk factors are also associated with physiological changes and specific conditions of the elderly, such as declining physical strength, decreased cognitive and affective capacities, chronic diseases - cardiovascular, neurologic, pulmonary, psychiatric, endocrine and metabolic, musculoskeletal abnormalities and joint degeneration.[2-6]

Already, the extrinsic risk relate to behaviors, activities, and social and economic conditions of older people and the environment. Behavioral risk factors are related to human actions, emotions or daily choices and are potentially modifiable; such as the use of several drugs, alcohol and tobacco, sedentary lifestyle, overweight or obese, fear of falling, use of inappropriate footwear and mobility aids artifacts.[1-2] socioeconomic risk are those related to social conditions and economic situations of the individual, and are guided by the community's ability to challenge them. They include factors such as low income, low education levels, inadequate housing, impaired social interaction and limited access to health and social assistance.[2] And environmental factors involve the interaction of the physical conditions of the individual with the surrounding environment, including hazards domestic and public environment as slippery surfaces, carpets, poor lighting, lack of support and grab bars in bathrooms and corridors, public roads with irregularities and badly maintained.[2-4]

♦ Evaluative instruments of risk of falls in the elderly person

The evaluation of the risk of falls in the elderly, through the instruments available in the literature, involves brief analysis of risk factors for falls submitted by that person.

The instrument "Fall Risk Score",[7] of course, has items that measure the risk of falls, but limited to the factors; previous falls, medication use, sensory deficit, cognition and gait. Thus, this instrument includes five items and measures the risk of falls due to them failing to consider intrinsic factors such as chronic diseases, balance, and extrinsic factors related to individual behavior and the environment. Already, other instruments are specific for one or two risk factors, such as the instrument "Timed Up and Go Test - TUGT"; which assesses gait and balance.[8] Also, we found in the literature "Falls Efficacy Scale - International (FES-I)",[9] in which the elderly person is asked about the fear of falling while carrying out 16 activities of life daily (ADL) and; the “BOMFAQ”[10] which evaluates

difficulties in performing ADLs. Also, we have the "Geriatric Depression Scale (GDS)"[11] validity in our culture and widely used as a diagnostic tool for depression in elderly patients.

Although in the literature there are instruments on risk factors for falls, health professionals lack the tools to assess the broad drop phenomenon in its entirety. Another issue is that some of these assessment tools are not available in our culture. Therefore, when you do not have validated instruments to meet the research and practice needs, highlight the alternatives; culturally adapt existing or build one according to our reality, ie how objective of this study.

METHOD

Article from dissertation << Construction of Evaluative Scale Falls Risk (EARQUE) for Non Institutionalized Elderly >> of the Nursing Postgraduate Program at the Federal University of Alfenas (PPGENF UNIFAL-MG) - Financial support: Training Coordination of Higher Education Personnel (CAPES).

Aiming to build such a scale carried out a study of the methodological type, which is directed to investigate methods used in other studies and is the development of specific tools for data collection, such as instruments and questionnaires.[12] For the construction of it was applied the Scale Theory of Psychometrics,[13] in which the construction of an instrument method consists of three procedures, namely; theoretical, empirical and analytical. However, this study was carried out only part of theoretical procedures, and is presented below.

Theoretical procedures

In this phase, focus was given to the explanation of the theory about the construct risk of falls for which you want to develop the measuring instrument and the operationalization of the construct itself in items,[13] that were indispensable for drafting the Evaluative Scale Falls Risk. Such procedures consisted in understanding and elaborate fundamental aspects of the construct, which are: dimensionality of the construct risk of falls, its constitutive definition, and the operational definitions of each risk factor and the operationalization of the items, ie the construction of the instrument.[13]

Dimensionality of the construct can be understood as the components of the conceptual structure so that the concept can be more clearly and sufficiently accurate for the construction of the items of the measuring instrument, in this case the risk of falls. To establish the dimensionality, it was necessary to understand the structure of the concept falls, which runs through the exploitation of their background, attributes and their consequent.[4] defining Attributes are words and/or phrases used to describe the defining characteristics of a specific concept making it distinct from other similar. It is understood by the concept of the background situations, events or incidents occurring in advance of the phenomena of interest. Help understanding the social context in which the concept is generally used, but also favors the refinement of the attribute. Already, consequential, refer to situations or events that happen a posteriori of the phenomenon, ie, result concept occurrence.[15]

Therefore, it adopted the following definition of falls: "[...] situation where an individual is inadvertently lean on the ground or another lower level; not an important consequence of intrinsic event (for example, stroke or syncope) or a risk of being impossible to overcome which causes decrease in most healthy people". [16:1701] The definition itself is the defining attributes the fall. Already, its antecedents involve the risk factors for falls, and the construct investigated in this study. Finally, the attendant of falls are related to the moves of the falls; resulting in fractures, bruises, loss of autonomy and self-esteem, institutionalization and even death,[4,17] among others. The importance of the recognition of such consequential meets the relevance of this study, and others whose work object the phenomenon falls.

Given the dimensionality of the construct, it was necessary to conceptualize it in detail, founded on the specific literature, personal experience of the authors and, in the other researchers. A clear concept and need of the factors for which wants to build the measuring instrument is necessary, resulting in this process two products, namely: constitutional definition of the risk of falls and the operational definition of each risk factor.

Constitutively defining a concept means to specifying its terms, that is, its semantics,[13] which has goals and limits of the construct risk of falls, placing it accurately and precisely within the theory of it. In this sense, as a constitutive definition of the phenomenon "downside risk in non-institutionalized elderly", adopted the risk factor definition proposed by the Virtual Health Library (BVS): "Aspect of individual behavior or of lifestyle, environmental

exposure or hereditary or congenital characteristics that, according to epidemiological evidence, it is known to be associated with a health-related condition considered important to be prevented. ".[18]

Already, the operational definition should be as comprehensive as possible, that is, really operational[13] and while precise description of something that gives meaning to the concept. Operational definitions are statements that represent the bridge between the observation of the phenomenon and the investigation instrument.[19] Thus, to determine the risk factors that make up each risk category for falls - biological, behavioral, environmental or socioeconomic - we used to literature review on databases; Latin American and Caribbean Health Sciences (LILACS), Medical Literature Analysis and retrieval System Online (MEDLINE) and US National Library of Medicine (PubMed/NCBI). Reading and analysis of publications identified the risk factors related to falls in older people and categorize them. Thus, they identified 55 risk factors for falls, 30 biological, 13 behavioral, four socioeconomic and eight environmental factors related to the inside of the home. At the end of the survey of these risk factors, it proceeded to the elaboration of operational definitions, which were built seeking textual elements; in order to provide content for the construction of items. Thus, for each risk factor related to an operational definition drop phenomenon has been established based on literature survey and thus proceeded to the operation, ie the construction of the instrument.

RESULTS

♦ Operationalization

To initiate such a construction, we used the spreadsheet LibreOffice Calc because the same offer more features and flexibility in data handling. And so began the development of evaluation instruments of risk of falls. In order to promote understanding and visualization of each risk factor, initially created a spreadsheet arranged in six columns. The first was described the classification of risk factors, ie biological, behavioral, socioeconomic and environmental; in the second column found themselves risk factors for falls; already the third operational definition of each factor, which offered grants for construction of the item; the fourth column contained underlying concepts involving the risk factor, they do not handle the operational definition, but enabled greater clarity to the understanding of risk factors for falls; the fifth column has been provided for the construction of the item; Finally, the last column was held for response or alternative indicators.

In addition to the operational definitions, other sources are consulted to build the items; as evaluation tools of specific risk factors for falls. These were printed and archived, making them more accessible. Among them, the more employees were the "Index of Independence in Activities of Daily Living Katz",[20] which assesses the independence of the elderly in ADL performance and the "Questionnaire of Pfeffer (PFAQ)" [21] that is intended to verify the presence and severity of cognitive decline by assessing the functionality and dependence to perform daily activities, besides the aforementioned "Falls Efficacy Scale - International (FES - I)", [9] in which the elderly person is questioned about the fear of falling during the implementation of 16 ADLs.

There are available on the sheet the classification of risk factors with their respective factors and also the construction of the items, the need to differentiate the evaluation instrument was realized in two parts, known as section A and B. For many risk factors are characterized as objectives or concrete and are recognized in the elderly through observation or information obtained from the person himself or his companion. Therefore, the section the range consisted of objective judgments and the B section by subjective, that is, express mainly attitudes and behaviors. Thus, the risk factors were allocated according to the need to formulate items objectively or subjectively. This configuration remained until the completion of the final instrument, being named as "**Scale**

♦ Evaluative of the risk of falls in the elderly person (EARQUE)".

In section A, some items were formulated through dichotomous questions, or are willing to be answered as present or absent, yes or no; and refer to the factors: previous falls, recurrent falls, history of fractures, medical conditions, use of assistive devices in the march, polypharmacy, drug use, living alone and environmental factors. In relation to items made for the factors of age, gender, low income and low education, there are specific response options for each factor.

Regarding the format of EARQUE regarding the disposal of items, preferred to describe them by means of interrogative sentences. And was elected using the Likert scale with four response options: never; sometimes; many times; always. The Likert scale is not a scale that is designed to determine the value

of the items, but the level of subject's compliance with the declaratory statements; This expresses the point of view on an issue and can be favorable or unfavorable relative to construct the object,[22] in the specific case - risk of falls.

With items already outlined it proceeded to a confrontation between them, to observe similarities or redundancies, and constantly asks if reported: - the contribution of this item to measure the risk of falls? And so, with the help of the operational definition of risk factor decided by the maintenance or exclusion of the same, and see if he was appropriately inserted into the sub-category of risk factor, ie: biological, behavioral, socioeconomic or environmental . Otherwise, it proceeded to exchange for the subcategory indicated.

Construction of EARQUE, also told by informed experts experience the area as a geriatrician doctor, teachers graduate researchers in pharmacy and a gerontologist, also a teacher, doctor and researcher; which participated in meetings with free discussion and analysis of the items, in order to verify suitability of content, spelling, language and clarity in writing. In this way, the total were listed items 55, 32 and 23 in section A in section B, which are presented in Table 1 and 2, respectively.

1 Gender	☐ Female	☐ Male			
2 Age	☐ Older than 100	☐ 80 - 99 years old	☐ 60 - 79		
3 Falls in the last year?	☐ Yes	☐ No			
4 Had more than two falls in the last year?	☐ Yes	☐ No			
5 History of fracture in the last year?	☐ Yes	☐ No			
6 Use of auxiliary equipment of the march? (cane, crutch, walker)	☐ Yes	☐ No			
7 Do you live alone?	☐ Yes	☐ No			
8 Individual monthly income (total income divided by people living in the house)	☐ Up to 1 minimum wage	☐ 1 – 3	☐ 3 - 5		
	☐ Up to 5 minimum wages.	☐ Don't know			
9 School attendance (in years)	☐ Did not go to school	☐ Until 4 years	☐ Until 8 years		
	☐ Until 12 years	☐ More than 12 years			
Use of medicines for more than 30 days :	10 Antiarrhythmics ☐ Yes ☐ No	11 Cardiotonics ☐ Yes ☐ No	12 Antihypertensives ☐ Yes ☐ No		
	13 Diuretics ☐ Yes ☐ No	14 Hypoglycemics ☐ Yes ☐ No	15 Psychotropics ☐ Yes ☐ No		
	16 Muscle relaxers ☐ Yes ☐ No	17 Painkillers ☐ Yes ☐ No	18 Other ☐ Yes ☐ No		
19 Polypharmacy-uses four or more medicines/day?			☐ Yes	☐ No	
Presence of illness or medical condition?	20 Hemodynamics-hypertension, COPD, anemia, dizziness/vertigo.		☐ Yes	☐ No	
	21 Metabolic-Diabetes mellitus, renal dysfunction.		☐ Yes	☐ No	
	22 Neuropsychiatrics - Depression, Parkinson's disease, Alzheimer's disease, STROKE, seizures.		☐ Yes	☐ No	
	23 Musculoskeletal-articular diseases, osteoporosis.		☐ Yes	☐ No	
	24 Oncological diseases		☐ Yes	☐ No	
The inner part of the house - situations that offer insecurity for elderly person.	25 Presence of stairs?		☐ Yes	☐ No	
	26 Floor with irregularities?		☐ Yes	☐ No	
	27 The presence of slippery floors?		☐ Yes	☐ No	
	28 Inadequate lightening?		☐ Yes	☐ No	
	29 The absence of grab bars and support?		☐ Yes	☐ No	
	30 Presence of furnitures preventing the free		☐ Yes	☐ No	

passage?

31 Presence of wires and other objects preventing the free passage? ☐ Yes ☐ No

32 Presence of carpets by preventing the free passage? ☐ Yes ☐ No

Figure 1. Section A of EARQUE.

Items	Never	Sometimes	Many times	Always
01 Has sense of loss of balance?	1	2	3	4
02 Has difficulty walking?	1	2	3	4
03 Has difficulty climbing stairs?	1	2	3	4
04 Has difficulty descending stairs?	1	2	3	4
05 Asks for help to get out of bed or sit in a chair?	1	2	3	4
06 Asks for help to bathe or dress up?	1	2	3	4
07 Asks for help to go to the bathroom for eliminations and, after, to make hygiene or to fix the clothes?	1	2	3	4
08 Asks for help to feed themselves?	1	2	3	4
09 Have visual difficulties for moving or sit?	1	2	3	4
10 Has difficulty seeing or find objects?	1	2	3	4
11 Have difficulties to hear information about any place you want to go?	1	2	3	4
12 Have difficulty hearing sounds or noises?	1	2	3	4
13 Has difficulties to understand and/or memorize guidelines received?	1	2	3	4
14 When you don't sleep well, feel more sluggish or hard to accomplish the tasks of the day?	1	2	3	4
15 When you get the urge to urinate, not to wet the clothes, you have to run to the bathroom?	1	2	3	4
16 Makes use of alcohol getting drunk?	1	2	3	4
17 Uses fingers slipper, shoes with worn soles, incorrect size, with heels, non-slip or not without fasteners?	1	2	3	4
18 In the last two weeks left to perform physical exercises?	1	2	3	4
19 Afraid of falling when their personal care or performs the house tasks?	1	2	3	4
20 Rises on benches or chairs to reach high objects or to clean the closet?	1	2	3	4
21 Down stairs carrying heavy objects?	1	2	3	4
22 Have difficulties to call neighbors, friends or relatives in cases of needs?	1	2	3	4
23 Have difficulties to receive support or help from neighbors, friends or relatives in cases of needs?	1	2	3	4

Figure 2. Section B of EARQUE.

Thus, the section A of EARQUE consists of 32 items and can be stated to be applied to the profile studies with identification of biological and behavioral, social, economic and environmental variables characterizing the elderly population as regards the risk of falls. Already, the section B contains 23 items and then employment in the polls, as can be with some of the clinical assessment of the elderly, in order to estimate the risk of falls in the same, in order to subsidize preventive interventions in achieving results expected; safety and quality of life. It is noteworthy that both sections are complementary and simple application, facilitating its use in clinical and in research.

Section B of EARQUE consists of subjective interrogative sentences referring to the way of being and acting of the elderly. When the Application Range, it is urgent that you carefully read each question and promptly, without much thought, to point out the alternative that best applies to the elderly. It is important that all items are answered. Whereas EARQUE intended for the elderly, so this not basically has characteristics of self-administration, the evaluator's intervention is often needed to facilitate the understanding of the constituents of the same questions.

DISCUSSION

The EARQUE consists of simple and direct sentences, without the use of expensive resources. It can be applied both by nurses and by other health professionals, trained in order to estimate the risk of falls in older people not institutionalized, meaning that elderly who do not reside in long-term care facility and is not hospitalized; due to the peculiar characteristics of these institutions for the risk of falls.

The construction of EARQUE was justified from the three main aspects statement, the first of which relates to non-existence in the literature of an instrument that encompass most of the risk factors for falls. Already, the second aspect is related to the impact of the fall phenomenon in security and quality of life of the elderly and; finally, the implementation of preventive interventions in achieving the optimization of health in the elderly is favored by identifying the risk of falls. In this sense it showed up to build a simple little tool, without redundancies, allow easy understanding and welcomed by professionals in health contexts. Therefore, we developed a comprehensive tool for risk factors for falls; however, without involving tests dispense longer application times, but easy operation, low cost and with objective and subjective questions and that estimates of Indeed, the risk of falls in older non-institutionalized people.

However, there is still a long way to go, as this scale requires validation processes to estimate its reliability and validity, ie the achievement of methodological procedures of semantic analysis and judges, in addition to empirical and analytical. Also, it is suggested that such a scale is applied to assess with other constructs or dimensions close to the risk of falls, as Falls Efficacy Scale (FES - I),[9] the scales that evaluate balance and gait, functional capacity, independence and others that permeate the conditions of falls for the elderly.

EARQUE is characterized as the innovative instrument to assess the risk of falls in the non-institutionalized elderly. At the same time, the fact of the developed scale be directed to the non-institutionalized elderly is a restriction because the ideal would be an instrument that would enable the identification of the risk of falls in both the elderly person living in the community or in long term care facilities

FINAL REMARKS

This study aimed to building a scale for assessing the risk of falls in the elderly, seeking to fill the gap in the literature of a large instrument to such an assessment. For this it used the Psychometrics in order to guide the methodological procedures in the construction of Evaluative Scale Falls Risk.

For the development of such a measure scale of risk of falls was essential to focus given to small theory on the construct "risk of falls". Thus, a survey of the empirical evidence was made in order to understand and elaborate key aspects of the construct, as the components of the concept falls, the definition of the risk of falls and operational definitions of each risk factor. To understand the conceptual framework falls resorted to the Theory of Concepts,[15] with the identification of the defining attributes of the background and the resulting phenomenon in question; and, risk of falls is configured as antecedent. The small theory possible, so essential, that the construct become more understandable and sufficiently precise for the definition of observable behaviors which signify the risk of falls, which in turn allowed the construction of items and all the items generated the scale as the risk of falls.

From this perspective, this scale is easily applicable in clinical practice can be converted into substantive contributions, after the consolidation of its validation in future studies. Therefore, this work is an important step in investigations of unsafe conditions for falls in the elderly.

This study reinforces the purpose of health professionals in the implementation of prevention programs falls by the elderly. In future research on the subject falls in elderly, it is important to broaden the scope of the investigation by making evaluation of such programs in order to observe changes produced in the knowledge, attitudes and behaviors that contribute to reducing the risk of falls. Thus, it is considered that the EARQUE may launch some clues for the design of preventive interventions to reduce the risk of falls and avoidance, as such, fall in the elderly.

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