

Frailty in Older Brazilians - FIBRA-RJ: research methodology on frailty, cognitive disorders and sarcopenia

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Abstract

The frailty syndrome is associated with adverse events, including disability and death. In Brazil, it is a poorly understood condition. The objective of this report was to present the methodology used in FIBRA-RJ, the Rio de Janeiro section of the Frailty in Brazilian Older People (FIBRA-BR) study, which was developed to overcome this gap in knowledge. The baseline study (first phase) was carried out in 2009-2010. The sample was composed of 847 individuals (65 years old and older, customers of a health care plan) randomly selected and stratified by sex and age. This phase estimated the prevalence of frailty and its associated factors. The second phase (2010-2011) estimated the prevalence of dementia and its associated factors, and the third phase (2012-2013) estimated the prevalence and incidence of sarcopenia/sarcopenic obesity and its associated factors. The prevalence of frailty was 9.1%, and it was associated with age, education, cognition, negative health perception, comorbidities, and deteriorating functionality. The prevalence of dementia was 16.9%, and it was associated with age and illiteracy. In total, eleven articles, four dissertations, and two theses were published; seven other theses and dissertations are in progress, which will include the results of phase 3. The FIBRA-RJ has reported descriptive studies with well-known limitations associated with reverse causality. Phase 3 will enable us to study incidences, and the predictive validity of biomarkers vis-à-vis mortality, adverse health outcomes, and the use of health services. The FIBRA-RJ study represents an advance in the understanding of the health problems that affect the aging Brazilian population.

Keywords: Vulnerability; Frail elderly; Epidemiologic studies; Aging.

Resumo

Fragilidade em Idosos Brasileiros - FIBRA-RJ: metodologia de pesquisa dos estudos de fragilidade, distúrbios cognitivos e sarcopenia

A síndrome de fragilidade está associada a eventos indesejáveis, como incapacidade e morte. No Brasil, é uma condição pouco conhecida. O objetivo do presente relato é apresentar a metodologia de trabalho utilizada no FIBRA-RJ, seção Rio de Janeiro do estudo Fragilidade em Idosos Brasileiros (FIBRA-BR), desenvolvido para superar esta lacuna. A linha de base (primeira fase) do estudo FIBRA-RJ foi desenvolvida em 2009-2010. A amostra (847 indivíduos, ≥ 65 anos, clientes de uma operadora de saúde) foi aleatória, estratificada por sexo e idade. Esta fase teve como objetivo estimar a prevalência de

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fragilidade e seus fatores associados. A segunda fase (2010-2011) teve como objetivo estimar a prevalência da demência e seus fatores associados. A terceira fase (2012-2013) buscou estimar a prevalência e incidência de sarcopenia/obesidade sarcopênica e seus fatores associados. A prevalência de fragilidade foi de 9,1% e esteve associada a idade, menores níveis de escolaridade e cognição, percepção de saúde negativa, comorbidades e pior funcionalidade. A prevalência de demência foi de 16,9% e esteve associada a idade e analfabetismo. No total, foram publicados onze artigos, quatro dissertações e duas teses; outras sete dissertações e teses estão em andamento, incluindo resultados da terceira fase. O FIBRA-RJ tem relatado estudos descritivos com conhecida limitação associada à causalidade reversa. A fase 3 nos permitirá estudar incidências e validade preditiva de biomarcadores vis-à-vis mortalidade, desfechos adversos e uso de serviços de saúde. O FIBRA-RJ representa um grande avanço no conhecimento sobre os agravos de saúde que acometem a população idosa brasileira.

Descritores: Vulnerabilidade; Idoso frágil; Estudos epidemiológicos; Envelhecimento.

Resumen

Fragilidad en Ancianos brasileños - FIBRA-RJ: metodología de investigación de los estudios de fragilidad, trastornos cognitivos y sarcopenia

El síndrome de fragilidad está asociada con eventos adversos como discapacidad y muerte. En Brasil, es una enfermedad poco conocida. El objetivo de este informe es presentar la metodología de trabajo utilizada en FIBRA-RJ, sección Río de Janeiro del estudio Fragilidad en Adultos Mayores Brasileños (FIBRA-BR), desarrollado para superar esta deficiencia. La línea de base (fase 1) del estudio de FIBRA-RJ se desarrolló en 2009-2010. La muestra (847 individuos, ≥ 65 años, clientes de un proveedor de salud) fue aleatoria, estratificada por sexo y edad. El objetivo de esta fase fue estimar la prevalencia de fragilidad y sus factores asociados. La segunda fase (2010-2011) tuvo como objetivo estimar la prevalencia de demencia y sus factores asociados. La tercera fase (2012-2013) tuvo como objetivo estimar la prevalencia e incidencia de la sarcopenia/obesidad sarcopénica y sus factores asociados. La prevalencia de fragilidad fue del 9,1% y se asoció con edad, educación y

cognición, percepción negativa de la salud, comorbilidad y peor funcionalidad. La prevalencia de demencia fue de 16,9% y se asoció con edad y analfabetismo. En total, se publicaron: once artículos, cuatro disertaciones y dos tesis; otras siete disertaciones y tesis están en marcha, incluyendo resultados de la tercera fase. El FIBRA-RJ ha reportado estudios descriptivos con limitaciones conocidas asociadas con causalidad reversa. La fase 3 nos permitirá estudiar las incidencias y la validez predictiva de biomarcadores con respecto a la mortalidad, desenlaces adversos y uso de servicios de salud. El estudio FIBRA-RJ representa un gran avance en la comprensión de los problemas de salud que afectan a la población de adultos mayores brasileños.

Palabras clave: Vulnerabilidad; Adultos mayores frágiles; Estudios epidemiológicos; Envejecimiento.

Introduction

The frailty syndrome in the elderly, which is a clinical condition that occurs secondary to a reduction in the functioning of multiple physiological systems, results in a high risk of incapacity and death, before minimal exposition to stressful factors.^{1,2}

This condition is directly associated with undesirable events, including falls, infections, morbidities, and institutionalization.^{3,5} In 2001, Fried et al.² proposed an operational definition of the frailty syndrome in the elderly. In 2006, with the aim of describing the prevalence of frailty and its associated factors, a group of researchers from Brazilian universities proposed a cooperation network: the Frailty in Brazilian Older People (FIBRA-BR) study.

The FIBRA-BR study was designed by a consortium of four universities including Rio de Janeiro State University, University of São Paulo (Ribeirão Preto), Federal University of Minas Gerais, and University of Campinas. Funding of the study was approved by the Brazilian National Council for Scientific and Technological Development (process number, 555087/2006-9). The FIBRA-BR study followed a transversal, observational, and multicenter design. Between 2009 and 2010, this study group interviewed and examined community dwelling individuals 65 years old and older who lived in cities in various regions of the country, and who had distinct sociodemographic characteristics. Study participant cities were selected according to the convenience of the research coordinators; however, the sample in each city was selected using a probabilistic strategy, in which individuals were stratified by sex and

age. In total, 7609 elderly individuals participated in the study, and were distributed across 16 cities: Barueri, SP; Belém, PA; Belo Horizonte, MG; Campina Grande, PB; Campinas, SP; Cuiabá, MT; São Paulo, SP; Fortaleza, CE; Ivoti, RS; Parnaíba, PI; Poços de Caldas, MG; Recife, PE; Ribeirão Preto, SP; Santa Cruz, RN; and Rio de Janeiro, RJ.

The participation of elderly individuals was voluntary, and the rules of the Brazilian National Committee for Ethics in Research of the Health Ministry for Research with Human Beings were respected. They were recruited from several sites, including Family Health Programs, Basic Health Units, Living Centers, population samples, Social Service of the Commerce, and a health care plan.

The Laboratory of Research on Human Aging - GeronLab, of the Rio de Janeiro State University, led the investigation in the city of Rio de Janeiro, constituting the FIBRA study - Rio de Janeiro section (FIBRA-RJ). Between January 2009 and January 2010 (13 months), the FIBRA-RJ study followed the protocol of other sites of the FIBRA-BR network, performing home evaluations of 847 individuals 65 years old and older living in the North Zone neighborhoods of the Rio de Janeiro city, and part of a health care plan customer base. However, unlike other cities in the network, this initial evaluation constituted the base line of a cohort, after which two more phases of the study were conducted. The second phase began in July 2010 and was concluded in June 2011; and the third was conducted from August 2012 to September 2013.

This article aims to introduce the study methodology used in the three phases of the FIBRA-RJ network study.

Methods

Phase I

Data collection protocol

In this phase, the research team involved in the FIBRA-BR study developed a questionnaire. The sample selection had the primary goal of maintaining a sufficient panel to a follow-up of at least four years. The variables of interest were mental state, sociodemographic characteristics and self-reported physical health, changes in body weight, falls, use of medication, use of health services, hearing and vision deficits, lifestyle, functional aspects of feeding, functional capacities of daily living activities, physical activity and anthropometric measures, assessment of muscle strength, gait speed, falls self-efficacy, depression, fatigue, and overall satisfaction with life. The research protocol can be obtained at www.geronlab.com.br.

The objectives of this phase were to analyze the prevalence of frailty according to the criteria proposed by the Cardiovascular Health Study (CHS)², and its associated factors, as well as determining the frailty risk profile and factors related to it.

Sample plan and selection strategy

The sample, stratified by age and gender, formed ten natural strata by sampling with male and female individuals, as follows: 65-74 years, 75-84 years, 85-94 years, 95-99 years, and ≥100 years.

The final strata were defined according to the number of people that comprised the natural strata, and the selection was given to the strata up to 94 years old, with the remaining strata (95-99 years and ≥100 years) considered as certain strata. In other words, all the people who were in these two age groups were contacted for the realization of the research. Thus, it was decided to group these two classes in a single stratum for each sex.

The sample of people in each final stratum was obtained by reverse random sampling. This type of sampling, proposed by Haldane,⁶ involves selecting as many units as necessary to obtain a prefixed number of interviews. This method is called inverse sampling, since, unlike the simple sampling process, which defines the number of households to be visited in an attempt to get interviews, it defines the number of interviews that will in fact be performed.⁷ The main advantage of this method is that it makes increasing the sample size to compensate for the non-response rate unnecessary, resulting in a lower cost of data collection.

In the FIBRA-RJ study, this sampling strategy was initiated when it was identified that a large amount of replacement elements would be required in each stratum to achieve the calculated sample size. Without loss of accuracy and reliability, it was possible to drive the field procedures until the entire sample was obtained.

Sample size calculation

The sample size was calculated so that the coefficient of variation of the estimator of different factors for frailty, in each natural stratum, was 15% for ratio estimates of 0.07, with a 95% confidence level. The final sample was obtained by summing the sample sizes calculated in each sampling strata. In each stratum, the number of people randomly selected (n_E) was calculated from the formula:

$$n_E = \frac{(1,96)^2 \cdot N_E^2 \cdot S_E^2}{(2 \cdot CV_E^2) Y_E^2 \cdot N_E^2 \cdot S_E^2}$$

where:

- n_E is the population size in stratum E;
- S_E is the population deviation associated with the estimator in stratum E;
- Y_E is the total population associated with the estimator in stratum E;
- CV_E is the prefixed coefficient of variation associated with the estimator in stratum E.

The sample size in each stratum (n_E), was initially calculated to ensure the accuracy of the estimates. Table 1 presents the total number of individuals per stratum, and the number initially selected and effectively consulted to obtain the total stipulated for each group. The total number of people listed in each stratum was the necessary amount to achieve the initial sample size established for each of them.

The total sample size for this study was 900 individuals. Table 1 presents the number of individuals selected per stratum (sex versus age group) and the total number of records sent (2.640) to the completion of 900 questionnaires. A greater volume of information was required due to the mortality rate of the groups and the high refusal rate associated with the younger ages. Furthermore, due to problems associated with the register, a specific treatment was required to compose the quantitative in strata.

Selection and training of research assistants

Students of undergraduate courses in public and private universities, as well as professionals interested in working in research, were selected. The training consisted of reading texts on aging in order to make the research assistant familiar with the population to be studied. The research concepts and the entire manual of data collection with detailed information of the protocol were introduced. When the assistants had been fully informed about the research context, they were trained in functional and cognitive assessment tools, in addition to instruments of anthropometric measurements. Once calibrated in this step, the assistants were trained in phone recruitment of the sample. Finally, they were trained in quality control, data storage in a specific bank, and organizing spreadsheets. During training, supervisors observed and evaluated the performance of the research assistants in each task, in order to divide them into tasks according to skill. The training process and team organization lasted for six months, and involved a total of 480 hours.

Organization of the research team

The research team presented the following configuration: a) field supervisors - responsible for monitoring all work processes, identifying problems, and suggesting and adopting resolving actions; b) recruiters - team in charge of making telephone contact with the sample, for scheduling home interviews, and organizing the

spreadsheets with the history of recruitment; c) field assistants - group designated to perform home visits for the implementation of the data collection protocol; d) quality control team - responsible for receiving the field questionnaires and reviewing them with the interviewer so as to leave no questions of doubt in the protocol and to decrease the possibility of missing data; and e) typist - responsible for data storage.

Sample recruitment

Before recruitment was initiated, letters were sent to drawn participants in order to inform them about the existing partnership between the university and the health care plan, to which they were affiliated, as well as the research procedures. Three weeks following the dispatch of the letters, the recruiters made telephone contact with the elderly individuals with the aim of scheduling home interviews. A maximum of eight phone attempts were made to locate the elderly research subject, or the individual responsible for the home in the case of incapacitation of the elderly subject. Contact with the research subject was made during business hours. In the case of difficulties in this process, one team of recruiters conducted telephone calls at nighttime and on weekends, until the person was found. In the cases where telephones were defective or calls were unanswered, a single recruiter was responsible for visiting the elderly subject directly to ensure that they were available for inclusion in the study.

To analyze the prevalence of frailty, the five items

Table 1. Population by age and sex, and the sample size in each stratum (n_e).

	Total population (NE)	Initial sample size (nE)	Number of people listed in each stratum (*)	Percentage of each stratum of the total listed for the sample (%)
Male (years)		Frequency (n)		
65-74	1381	108	361	13,7
75-84	1364	106	348	13,2
85-94	396	31	132	5,0
≥ 95	26	26	26	1,0
Female (years)		Frequency (n)		
65-74	2688	210	649	24,6
75-84	2810	219	733	27,8
85-94	981	77	268	10,2
≥ 95	123	123	123	4,7
Total	9769	900	2640	100,0

of the CHS frailty scale were used (Table 2).

To determine the frailty risk profile, the Probability of repeated admission (Pra)⁸ instrument was used, which consisted of eight items included in the questionnaire, as follows: (a) self-evaluation of health, with the following response options: “very good”, “good”, “regular”, “bad”, or “very bad”; (b) hospitalization in the last year; (c) a number of medical visits in the last year; (d) the presence of diabetes mellitus; (e) the presence of coronary disease; (f) gender; (g) availability of a caregiver when necessary; and (h) age. Pacala et al.⁹ have described the logistic equation and the regression coefficients corresponding to each of the eight items. The elderly were stratified as high-risk when Pra was ≥0.5. The use of the formula is detailed in www.geronlab.com.br.

Phase II

The second phase of the study, which commenced in July 2010, involved contacting the same sample and had the following objectives: to estimate the prevalence of dementia in the elderly population of the north zone of Rio de Janeiro; to validate the Informant Questionnaire on Cognitive Decline in the Elderly (IQCODE);¹⁰ and to study various psychometric properties of the Functional Activities Questionnaire (FAQ), created by Pfeffer¹¹ in 1982. In this stage, 23 subjects were excluded

for being institutionalized, hospitalized, or for change of address; 55 had died; 69 refused participation; and 17 were not located. A total of 683 subjects were analyzed.

Sample recruitment

Five research assistants were trained for the telephone recruitment. The calls were conducted initially between 8h and 17h from Monday to Friday. In the case of failure, new contact attempts were made on weekends and at night. In a brief telephone call, the elderly subject was invited to participate in the study, after explaining the research objectives and the data collection procedures. In the case of agreement by the participant, an interview was scheduled at an outpatient unit of the university. A subject was considered “missing” if they could not be contacted after eight attempts during business hours, and after four more attempts made at night and/or on weekends.

In this stage, the elderly subject was asked to refer a relative or friend who could answer various questions by phone. The recruiter made contact with them by phone and applied the FAQ.^{11,12}

Sample selection

In this phase of the study, the sample was selected based on the cognitive and functional status of individuals, seeking those with suspected dementia.

Table 2. Frailty scale proposed by the Cardiovascular Health Study and respective diagnostic criteria.[‡]

Item	Measure
Weight loss	Cases with self-reported unintentional loss of >4.5 kg in the previous year, and/or those with a BMI < 18.5 kg/m ² .
Grip strength	Using a manual dynamometer in the dominant upper limb, the participant was asked to exert the greatest possible strength >3 times. Frailty was considered for those cases in the first quintile, after adjusting the result for sex and BMI.
Feeling of exhaustion	Two questions from the Center for Epidemiological Studies Depression Scale* were used: item 7, “I felt that everything I did was an effort”; and item 20, “I could not get going.” Those who answered “yes” to either of these questions were considered cases of frailty.
Gait speed	The time taken to walk a distance of 4.6 m in a straight line was assessed. Frailty was considered for those cases in the first quintile, after adjusting for height and sex.
Decreased physical activity	The Minnesota Leisure Time Activities Questionnaire [‡] was used. For each activity performed by the elderly individual, the weekly caloric expenditure was calculated. Frailty was considered for those cases in the first quintile.

[‡] Fried LP, Tangen CM, Walston J, et al. Frailty in older adults: evidence for a phenotype. *J Gerontol A Biol Sci Med Sci.* 2001;56(3):M146-56.

*Batistoni SS, Neri AL, Cupertino AP. [Validity of the Center for Epidemiological Studies Depression Scale among Brazilian elderly]. *Rev Saude Publica.* 2007;41(4):598-605.

[‡] Lustosa LP. Tradução e adaptação transcultural do Minnesota Leisure time physical activities questionnair em idosos. *Geriatrics & Gerontologia.* 2011;5(2):5.

The Mini Mental State Examination (MMSE) score, applied in phase 1 of the study, was used for screening of cognitive decline. To screen for functional disability, the FAQ^{11,12} was applied, following participant authorization, to informants who were knowledgeable of the elderly subject's performance in the activities of daily living. An individual was considered eligible for subsequent clinical and neuropsychological evaluation if their performance on MMSE and FAQ were <28 and ≥5, respectively.

Accordingly, 250 individuals were not considered to have cognitive dysfunction due to having MMSE scores above the cutoff point. Another 215 individuals were excluded because, despite their MMSE scores being <28, they had a preserved functional capacity, i.e., FAQ <5. In total, 271 individuals fulfilled the criteria for suspected dementia, and progressed to the subsequent stage.

Clinical and neuropsychological evaluation of the sample

Global cognitive status, functional capacity, and humor

The subjects had their global cognitive status reassessed by the MMSE¹⁴. The functional capacity of the subjects was determined using the following instruments: a) basic activities of daily living - BADL¹⁵; b) instrumental activities of daily living - IADL¹⁶; and c) inventory of advanced activities of daily living - AADL.¹⁷ The Geriatric Depression Scale (GDS)¹⁸, and the Structured Clinical Interview for the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV)¹⁹, were used to evaluate the subjects for depression.

Clinical evaluation

All individuals who agreed to participate in the study underwent a clinical evaluation in the Geriatric Service at the outpatient clinic of the Rio de Janeiro State University. The focus of this evaluation was the investigation of dementia. For this purpose, a physical examination was performed, with an emphasis on neurological findings, clinical anamneses to assess the onset and progression of forgetfulness, behavioral alterations, depressive symptoms, and changes in renal function and hepatic function. In addition, laboratory tests were performed, including complete blood count, VDRL, HIV, interleukin 6, vitamin B12, folic acid, and thyroid hormones.

At this stage there were 55 refusals. Elderly subjects who were diagnosed with dementia were referred to

have a brain MRI scan. Of the 105 referred to this procedure, 64 accepted and underwent the examination proposed by the study protocol; 6 presented results of an MRI undertaken in the preceding year; 10 refused participation; and 25 presented reasons that prohibited inclusion, including metallic prostheses and claustrophobia.

Neuropsychological evaluation

Following the clinical evaluation, elderly subjects who did not meet the exclusion criteria for performing the tests - serious damage to sensory acuity and dementia at an advanced stage - were referred to the neuropsychological evaluation, which consisted of the following tests: a) Rey auditory verbal learning test²⁰; b) verbal fluency test FAS²¹ and fruit category; c) subtest of visuoconstructional skills of the Mattis Dementia Rating Scale; d) and the subtests of matrix reasoning, digits, coding, comprehension, and vocabulary of the Wechsler Adult Intelligence Scale-III.^{24,25}

Dementia diagnosis criteria

The syndromic diagnosis of dementia was established in a consensus by three geriatricians and one neuropsychologist, according to the criteria of the DSM-IV.¹⁹ For the etiological diagnosis of dementia, as well as the DSM-IV, the consensus of the following institutions and groups were used: National Institute of Neurological Communicative Disorder and Stroke-Alzheimer's Disease and Related Disorders Association - NINCDS - ADRDA,²⁶ National Institute of Neurological Disorders and Stroke and the Association Internationale pour la Recherche et l'Enseignement en Neurosciences - NINDS-AIREN.²⁷

The trajectory of the subjects during this phase of the study is detailed in Figure 1.

Phase III

Phase III was held from August 2012 to September 2013, and had the following objectives: to estimate the prevalence and the incidence of sarcopenia in the elderly population of the north area of the Rio de Janeiro city; and to evaluate the predictive validity of the frailty screening instrument "Probability of repeated admission".

Sample recruitment

As in Phase II, research assistants performed recruitment. Initially, a telephone approach was used to set a personal contact for performing the interview, after

which the elderly or appropriate informant answered a questionnaire that aimed to analyze the use of health services. In cases where individuals had died during the follow-up period between phases, specific questions regarding this outcome were included in the interview with the informant. Undergraduate research fellows, who had been trained for the task execution, performed telephone contact daily. Telephone contact in an attempt to locate an individual was performed a maximum of eight times. In the case of telephone contact difficulty, the following strategies were adopted: a) telephone contact with relatives/friends to locate the elderly subject; b) home visits; and c) visits to the homes of elderly neighbors in order to locate the subjects when they were not found at the source address.

It was considered missing when the elderly subject or a substitute informant could not be located after all attempts.

At this stage, an attempt was made to contact all 847 subjects from the baseline. It was found that 136 had died, 64 could not be located, 143 refused participation, and 102 were excluded for any of the following reasons: MMSE ≤ 13 ; institutionalization; difficulty of wander; or severe cognitive impairment. The final sample consisted of 402 subjects who participated of phase 1 and were interviewed at home at phase 3. All were invited to attend the subsequent stages, when the blood tests and the benchmarking of body composition were performed. For those with difficulty in travelling from their home to the place of examination,

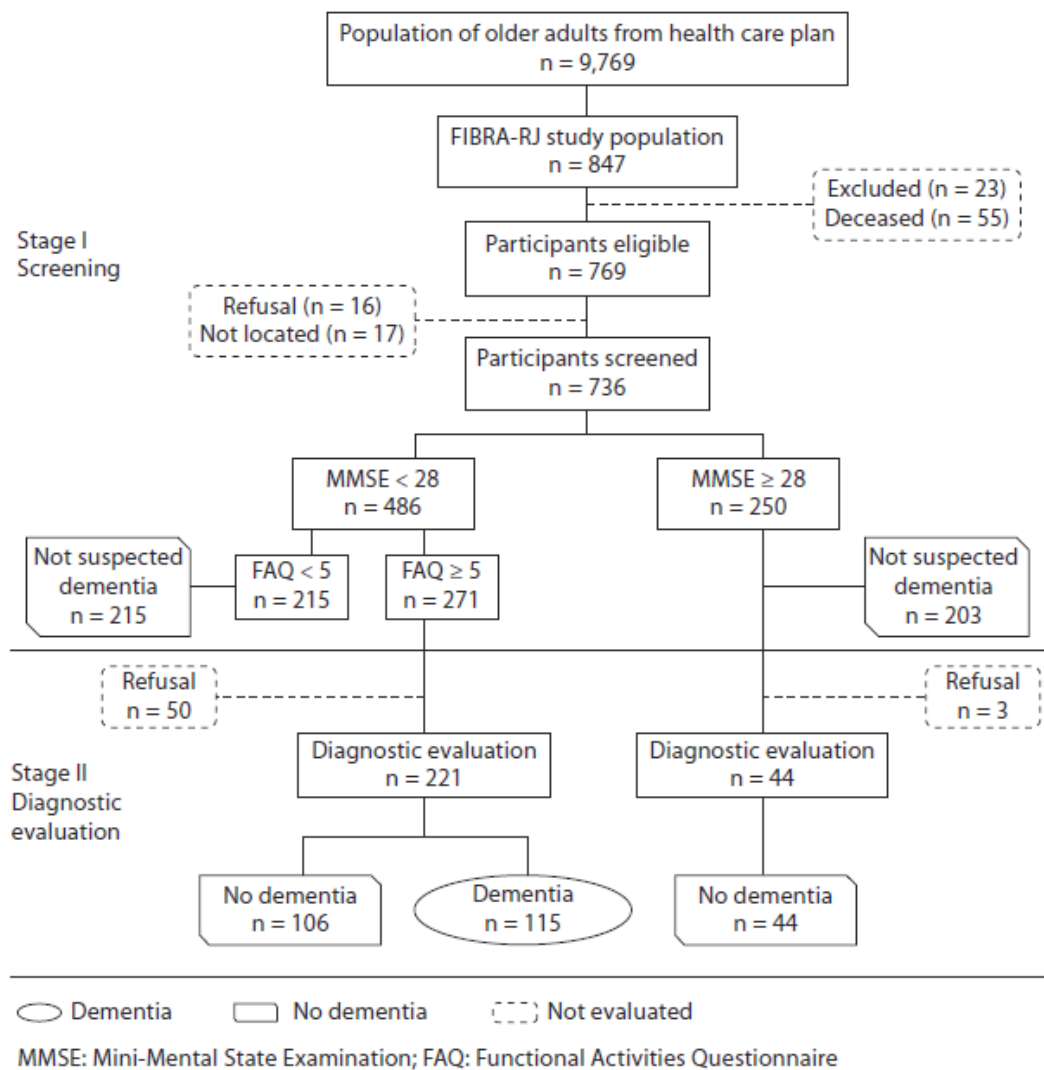


Figure 1. Flow diagram of sample selection – FIBRA-RJ Phase II.

transportation was offered. In total, 300 individuals agreed to proceed with the study: 297 underwent the blood test; and 284 underwent electrical bioimpedance (BIA) and dual-energy X-ray absorptiometry (DXA) for assessment of body composition (Figure 2). Those who did not undergo the examinations were excluded for some condition that prevented the procedure.

Data gathering

After scheduling of the interview, the elderly subject received a visit from a scientific initiation student who, immediately after obtaining informed consent, applied the questionnaire, gauged the anthropometric measurements, and conducted the gait evaluation. At the end of the interview, the subject was handed an educational prospectus with information about sarcopenia, and was informed that consent would be asked in the future to perform further examinations that would aid in the diagnosis of the problem investigated. This stage was named “first displacement” and gave rise to three more displacement stages until the end of phase III of the FIBRA-RJ study.

In the second displacement, the elderly subject was

invited via telephone to visit the outpatient geriatric unit of the Policlínica Piquet Carneiro, Rio de Janeiro State University, to undergo a blood test after fasting for 12 hours, and to evaluate muscle mass by electrical BIA. Before each activity, participants had given informed consent. After this stage, they were invited to attend the assessment of body composition by DXA.

Assessment of body composition - BIA

Muscle mass was estimated by BIA, using a portable bioelectrical impedance electronic device (QUANTUM II, RJL Systems, Inc., USA) with a crystal liquid display, at a low-intensity current of 800 μ A and a frequency of 50 kHz.

All elderly subjects were advised to consume 2 L of fluids on the day before the test; to fast for at least 4 hours before the test; to not undertake physical activity for 24 hours before the test; to avoid alcohol consumption for 48 hours before the test; to avoid the use of diuretics on the day before the test; to urinate at least 30 minutes before the measurement; and to avoid the consumption of caffeine for 24 hours before testing.

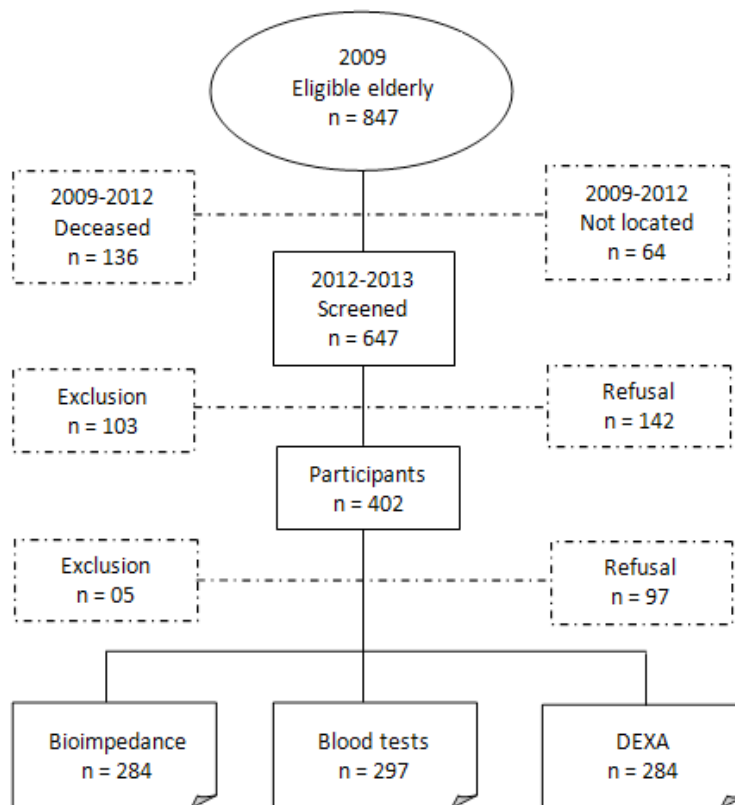


Figure 2. Flow diagram of sample selection – FIBRA-RJ Phase III.

Assessment of body composition - DXA

For the assessment of body composition by DXA, the GE Lunar IDXA device from General Electric was used. This type of evaluation involves measuring the emission of X-rays at two frequencies of different intensities, which, by passing through the participant's body, separate due to the different attenuation capacities of X-rays in fat and bone tissues.

For performing the examination, participants were positioned supine on the equipment, in order to remain fully centralized in relation to the sides of the table.

Results

The FIBRA-RJ study gave rise to a series of papers, masters dissertations and doctoral theses.^{3,12,28-36}

Discussion

The FIBRA-BR study, due to its multicenter design, likely represents one of the most comprehensive efforts of Brazilian researchers in the investigation of the dimensions of frailty and its associated factors in Brazil to date.

The Rio de Janeiro segment of this study, the FIBRA-RJ, represents an attempt to go beyond the initial aims of the FIBRA-BR, and to continue the monitoring of the sample population examined. It investigated other aspects of health impairment that are common among the elderly and require further population studies with larger sample sizes.

In all three phases that constituted the FIBRA-RJ, the predominant focus was on descriptive cross-sectional studies of prevalence and factors associated with frailty, dementia, and sarcopenia. In addition, some geriatric assessment instruments were analyzed from the point of view of their transcultural adaptation for Brazil.^{12,35,36}

Such studies have shown limitations associated with reverse causality, which prevents assured conclusions about the chronological order of phenomena; however, they were necessary because, until now, few studies have described these conditions in the Brazilian population.

It should also be highlighted that the accumulated data have allowed us to reflect on extremely important issues, including those that are relevant for the assistance of the elderly, as well as for the investigation into the field of human aging, including mobility, muscle mass and muscle strength.

Researchers from affluent countries have develo-

ped a substantial number of the measurements used in geriatric patients, and have validated them in their populations. The usual gait speed and the handgrip strength, which can be included among these measures, are so important in the assessment of elderly patients that the handgrip strength is cited in scientific literature as the 6th vital sign.³⁷ However, in Brazil, they have not achieved such popularization, since both investigators and clinicians, when using them, are forced to define the normality of the phenomenon based on cutoff points that were developed in other realities, on the untested assumption of an unlikely universality. Our findings, although preliminary, point in the opposite direction to universality, suggesting that, for the Brazilian population (and likely Latin America), other reference values need to be defined.³⁸ Phase III will allow us to study these issues, establishing the accuracy of these and other measurements available in the database, vis-à-vis mortality, adverse outcomes, and the use of health services.

The FIBRA-RJ cohort comes from the database of a private operator of health services. This study population, when compared with the entire elderly population of Brazil, has a higher income, better education, and a higher percentage of people in older age groups. Thus, the findings presented may not be comparable to those of Brazilian population-based studies. On the other hand, this profile may adequately represent a substantial portion of the Brazilian elderly population, that is, one that is a client of private health services in partnership with a health care plan, particularly in the context of large urban centers.

In addition, the study of elderly with supplementary health sector support can assist in understanding the impact of access to health services in the older population. This fact is relevant since the epidemiological investigations conducted in Brazil using health records generally give priority to the public sector, neglecting relevant information that may come from sources such as the private health care plan. Despite these limitations, the specificities of the FIBRA-RJ sample may represent major advances in knowledge regarding health disorders that affect the aging population, and may increase the knowledge about a population that, in general, has rarely been studied in the Brazilian context.

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