CLINICAL, FUNCTIONAL, AND SOCIOFAMILIAL PROFILES OF THE ELDERLY FROM A COMMUNITY IN A DISTRICT OF LIMA, PERU

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ABSTRACT

Objectives. To determine the clinical, functional and socio-familiar profile of seniors from a community in a district of Lima, Peru. ***Materials and methods.*** Descriptive cross-sectional study of a sample of 501 people aged 60 and over living in the San Martin de Porres district. We used a structured questionnaire in which clinical, functional and socio-familiar variables were recorded. A physical evaluation was carried out to assess performance based measures and serum samples were taken for hematological and biochemical examination. The data were presented with descriptive statistics such as frequencies and percentages for categorical variables and means and standard deviations for the numeric variables. ***Results.*** A total of 501 older adults were evaluated. The mean age was 71.5 years (±8.9 years). The most common chronic disease was arterial hypertension at 40.9%, followed by rheumatic diseases with 36.9%. 27.7% had some degree of partial or total dependence in activities of daily living, 16.2% had cognitive impairment, 8% lived alone, 58.5% had or were at risk of having a social problem.61% self-rated their health as normal, while 16% rated it as bad or very bad. ***Conclusions.*** Seniors in the community of San Martin de Porres in Lima have frequent problems of functional dependence, have or are at risk of social problems, chronic illness and a high frequency of geriatric syndromes and problems.

Key words: Elderly; Health status; Geriatric assessment; Community (source: MeSH NLM).

INTRODUCTION

The demographic transition in Peru, Latin America, and the world shows a gradual increase in the number of individuals over 60 years of age [(1)] in recent population censuses. According to the latest survey by the National Institute of Statistics and Informatics (INEI, Spanish acronym) in 2014, the elderly represent 9.4% of the total population. That study also showed that the fastest growth rate is that among people over 80 years of age, with the resulting increase in life expectancy [(2)].

There is an epidemiological transition due to a shift in the main causes of mortality and morbidity from communicable or infectious diseases to noncommunicable or chronic-degenerative diseases; this transition has caused substantial changes during the past 20 years in the pattern of diseases in Peru. We are not prepared for the rise of noncommunicable chronic diseases, either individually or as a healthcare system [(3)]. A nationwide study on the disease burden, which is defined as the health problems resulting from fatal and nonfatal consequences of different diseases, showed that a greater burden is attributed to noncommunicable diseases (58.5%), which to a greater extent affect children under 5 and adults over 60 years of age [(4)].

The elderly group, though not the largest segment of the population, is the fastest growing and requires more health services. This group has various illnesses that

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affect quality of life (vision, hearing, cardiovascular, motor, joint, cognitive, and emotional problems) and lead to a loss of independence, increasing the care needs and care costs. Furthermore, the members of this group who are in good health are at the highest risk of losing it [5]. Nevertheless, despite all the risks and needs, ironically, we know little about the realities of overall health among the elderly in this country.

Due to the specific characteristics of the elderly population and its growth as a population group in our country, we need to elucidate the clinical, functional, and sociofamilial profile of this population in our environment, which is lacking systematized information thereon. This is necessary to intervene in a way that helps improve general health and quality of life in this population group.

MATERIALS AND METHODS

DESIGN AND STUDY POPULATION

This is a cross-sectional descriptive study (carried out from January to May 2013) on 501 noninstitutionalized individuals over 60 years of age from the community, who live in the district of San Martín de Porres.

DESCRIPTION OF THE STUDY AREA

The district of San Martín de Porres is located in the northern part of Lima, the capital of Peru, and according to the INEI, the current population is 686,702 residents, being the second most populous district not only in the province of Lima but in the whole country. The elderly population in this district is 70,568 and represents 10.27% of the total population, with the aging index (a ratio of the number of senior citizens to the number of children and young people) of 36.6% [2].

PROCEDURES

The senior citizens were evaluated by means of semiprobabilistic sampling by housing clusters. The district was subdivided into eight sections, distributed according to the population receiving care at healthcare institutions. The homes of each section were selected using a table of random numbers, and the elderly living in each home were interviewed. If there were no senior citizens living in the home selected, then the adjacent home was analyzed. The criteria for inclusion were as follows: adults older than 60 years of age who live in the district of San Martín de Porres. Those who did not wish to participate in the study and institutionalized senior citizens were excluded.

Four trained geriatric doctors made 44 field trips. Forty-five senior citizens refused to participate in the study, and a total of 501 senior citizens were surveyed. The data were collected in three different ways: an interview, a physical exam, and laboratory tests. An structured questionnaire for interviews was used, in which clinical variables, functional evaluation, and sociofamilial variables were registered. An anthropometric assessment was performed using a nonelastic measuring tape, a wooden height rod, and a digital scale, which was recalibrated every 10 measurements. Performance evaluation was also carried out by means of walking speed [6] and a timed up & go test [7]; both measurements were taken using a calibrated stopwatch. Laboratory personnel collected 7 mL of peripheral blood under the supervision of the researchers for hematological and biochemical testing after 8 hours of fasting. The samples were kept refrigerated and immediately transported for processing to the laboratory in Cayetano Heredia National Hospital. In total, 314 laboratory samples were collected, which corresponded to the elderly who agreed to participate in the study and consented to have blood samples taken. Some patients did not undergo all the planned serum tests due to problems with transportation, conservation, and sample processing.

VARIABLES

Interview

- Self-perception of health: self-report of the health condition, categorized as good, normal, and bad [8].
- Chronic and acute diseases: self-report of the presence of chronic diseases and acute infectious diseases in the past year as well as immunizations and bad habits.
- Cognitive evaluation: we used the Pfeiffer Test [9], which is based on 10 questions, with the following ratings: normal, 0 to 2 errors; mild cognitive impairment, 3 to 4 errors; moderate cognitive impairment, 5 to 7 errors; and severe cognitive impairment, 8 to 10 errors.
- Affective evaluation: we used the abbreviated depression screening with four questions validated for our area [10]. If two positive responses were obtained, the Yesavage Geriatric Depression Scale [11] was used, which consists of 15 questions and yields a score: from 0 to 5 points, normal; 6 to 9 points, mild depression; and more than 10 points, severe depression.
- Self-reported geriatric syndromes and problems: falls, incontinence, edentulism, and vision or hearing loss.

- Sleep problems: the self-report of problems with falling asleep, staying asleep, and daytime sleepiness were evaluated [8].
- Functional evaluation: based on the Barthel Index (12), which evaluates the basic activities of daily life, with a total score of 100 points corresponding to an independent elderly adult; a score over 60 representing slight functional dependency; and a score of less than 20 representing total dependency.
- Social evaluation: we used the Gijon Sociofamilial Evaluation Scale [13] with three categories: good social situation, at risk, and social problems.
- Access to healthcare services: determined by the report of the type of medical institution used (public, private, other, or does not visit any healthcare institution).
- Insurance status: testing whether the elderly adult has health insurance, public or private.
- Family type: determined by the number of family members and the type of relationships among them; classified as nuclear (a couple with or without children or a single family head with children); extended (nuclear family plus other family members); combined (nuclear or extended family with nonfamily members); single-person (consisting of only one person), and nonnuclear (a group of people, one of them being the head of the household but without a spouse or children, who lives with other people to whom he/she may or may not be related) [14].
- Family dysfunction: evaluated by means of the family APGAR [15] (an acronym for the following characteristics: adaptability, partnership, growth, affection, and resolve), which is composed of five questions and evaluates the adaptability, cooperation, development, affectivity, and resolution capacity of the family, classifying it as functional (7 to 10 points), moderately dysfunctional (4 to 6 points), or severely dysfunctional (0 to 3 points).
- Presence of a caregiver: defined as the presence of a caregiver for of the elderly adult.
- Time use: categorized as the use of time in unpaid domestic activities (includes daily household activities and taking care of children and people with some degree of dependency); unpaid and/or personal nondomestic activities (any activity satisfying personal, educational, social, or voluntary needs) [16], and paid activities outside the home (any activity related to goods and services that generate income).

Physical evaluation

- Recorded blood pressure: measured using a mercury sphygmomanometer calibrated daily; systolic pressure was classified as elevated if it was >140 mmHg, and diastolic pressure was classified as elevated if it was >90 mmHg [17].
- Nutritional status: evaluated by three methods—the body mass index (BMI), mini nutritional assessment (MNA), and abdominal girth. BMI was used in accordance with the categories of the "Elderly adult nutritional guide" from the Peruvian Ministry of Health [18]: underweight (BMI less than 23), normal (BMI between 23 and 28), overweight (BMI between 28 and 32), and obese (BMI greater than or equal to 32). The MNA [19] is a questionnaire that detects the presence of malnutrition in the elderly; malnutrition was assumed if the score was less than 17, at risk of malnutrition: between 17 and 23.5, and good nutritional condition: the score greater than or equal to 24. As for abdominal girth [18], if male abdominal girth was 102 cm or more, and female girth was 88 cm or more, this situation denoted abdominal obesity.
- Walking speed [6]: it was determined by the time required for the participant to walk a distance of 8 meters out of a total distance of 10 meters at the normal walking speed, without a warm-up period. The first and last meter of the walk were not analyzed. The shorter time between two measurements, after an initial untimed lap, was recorded. A walking speed of less than 0.7 m/s was assumed to denote frailty [6].
- Timed up & go test [7]: the patient was seated in a chair, with his/her back well supported by the chair. He/she was then asked to get up (without supporting him/herself) and walk 3 meters, turn, and return to the seat and sit down again. The time that it took to perform this activity was recorded. The time more than 20 seconds was assumed to denote a high risk of falling.

Laboratory tests

- Hemoglobin: a value expressed in g/dL, assuming that a value of 12 g/dL in women and 13 g/dL in men denote a lower limit of the norm [20].
- Albumin: a value expressed in g/dL, assuming that a value of 3.5 g/dL in both sexes is a lower limit of the norm [20].
- Cholesterol: a value expressed in mg/dL, assuming that a value of 200 mg/dL in men means high cholesterol. As for low-density lipoprotein (LDL)-cholesterol, a value higher than 100 mg/dL was considered elevated; triglycerides at the concentration higher than or equal to 150 mg/

dL were considered elevated. As for high-density lipoprotein (HDL)-cholesterol, a value <40 mg/dL was considered low for both sexes [21].

- Basal plasma glucose: a value expressed in mg/dL; levels of basal plasma glucose greater than or equal to 126 mg/dL were considered "suspected diabetes"; the criterion of two samples for the definitive diagnosis of diabetes was not met [22].

STATISTICAL ANALYSIS

The data were analyzed in the SPSS 13 software after coding. The data are presented as descriptive statistics, such as frequencies and percentages for categorical variables and means and standard deviations for numerical values. Associations among factors were evaluated by chi squared tests and analysis of variance (ANOVA). Differences (or associations) with $p < 0.05$ were considered statistically significant.

ETHICAL CONSIDERATIONS

The research project was evaluated and approved by the Ethics Committee of Cayetano Heredia University in Peru. Informed consent was obtained from the senior citizens or from their immediate relatives if any degree of cognitive deterioration was detected. All the participants were informed of the results and the implications. The participants that were found to have some pathology or aberrant results of an examination at the time of the study were referred to their Ministry of Health medical center or the geriatric out-patient clinic of Cayetano Heredia National Hospital.

RESULTS

A total of 501 senior citizens were analyzed; we obtained information directly from the respondents in the case of 468 individuals (93.4%), and indirectly through another person in four cases (0.8%), and both the respondent and another person in 29 cases (5.8%). The average age was 71.5 ± 8.9 years, and the age range was from 60 to 99; 239 participants (47.7%) were between the ages of 60 to 69 years, 165 (32.9%) were between the ages of 70 and 79 years, and 97 (19.4%) were over 80 years old. A total of 313 participants (62%) were females, 35 (7%) of the elderly did not receive any schooling, and 19.6% (98 senior citizens) were single or widowed. The results of the clinical and laboratory evaluation of the elderly by age groups are shown in Table 1.

Table 1. Clinical and laboratory characteristics of elderly people in the community of the San Martín de Porres District.

Variables	Total		60 to 69 years		70 to 79 years		80 years or older	
	Average	(SD)	Average	(SD)	Average	(SD)	Average	(SD)
Walking speed, m/s (n=446)	1.0	(0.3)	1.1	(0.3)	0.9	(0.3)	0.8	(0.3)
Get-up and go test, s (n= 441)	13.9	(15.6)	11.9	(13.6)	15.3	(18.5)	17.5	(14.7)
Weight, kg (n=494)	65.4	(14.1)	68.2	(14.3)	63.8	(13.5)	60.6	(13.2)
Body mass index (n=494)	27.6	(5)	28.3	(5.1)	27.1	(5)	26.5	(4.6)
Abdominal girth, cm (n=500)	98.9	(12)	99.3	(12.4)	98.5	(12.3)	98.6	(10.5)
Systolic blood pressure, mmHg (n=501)	125.2	(19.9)	122.3	(20.5)	127.7	(18.7)	128.1	(19.9)
Hemoglobin, g/dL (n=311)	13.2	(1.4)	13.5	(1.2)	13.2	(1.3)	12.8	(1.7)
Fasting glycemia, mg/dL (n=314)	98.8	(49.9)	100.8	(55.3)	101.8	(52.4)	89.1	(26.9)
Albumin, mg/dL (n=314)	3.9	(0.4)	4.1	(0.3)	3.9	(0.4)	3.8	(0.4)
Cholesterol mg/dL (n=288)	190.6	(39.8)	195.8	(41.2)	189.8	(39.8)	181.1	(35.3)
Triglycerides, mg/dL (n=281)	110.9	(31.9)	114.5	(30.8)	110.2	(33.9)	105.3	(29.6)
LDL cholesterol, mg/dL (n=288)	174.3	(87.9)	181.7	(92.9)	173.6	(88.8)	159.9	(73.8)
LDL cholesterol, mg/dL (n=288)	44.7	(13.5)	44.8	(13.5)	44.9	(14.3)	43.8	(12.2)

m/s = meters per second, s = seconds, kg = kilograms, cm = centimeters, mmHg = millimeters of mercury, g/dl: grams per deciliter, mg/dL: milligrams per deciliter, SD: standard deviation

Table 2. Chronic diseases self-reported by elderly people in the San Martín de Porres community (n=501)

Variables	Total		60 to 69 years		70 to 79 years		80 years or older	
	n	(%)	n	(%)	n	(%)	n	(%)
Arterial hypertension	205	(40.9)	78	(32.6)	79	(47.9)	48	(49.5)
Rheumatic disease	185	(36.9)	80	(33.5)	66	(40)	39	(40.2)
Dyslipidemia	119	(23.8)	60	(25.1)	39	(23.6)	20	(20.6)
Type 2 diabetes	78	(15.6)	37	(15.5)	27	(16.4)	14	(14.4)
Heart diseases	51	(10.2)	16	(6.7)	19	(11.5)	16	(16.5)
Lung disease	34	(6.8)	13	(5.4)	14	(8.5)	7	(7.2)
Depression	21	(4.2)	5	(2.1)	11	(6.7)	5	(5.2)
Cerebrovascular diseases	19	(3.8)	7	(2.9)	9	(5.5)	3	(3.1)
Tuberculosis	10	(2)	4	(1.7)	4	(2.4)	2	(2.1)
Dementia	4	(0.8)	0	(0)	1	(0.6)	3	(3.1)

In terms of sociofamilial characteristics, 356 participants (71%) belonged to nuclear families, 40 (8%) lived alone, and according to the family APGAR, 91 (18%) had a dysfunctional family. As for the sociofamilial circumstances, 255 participants (50.9%) were at risk of social problems, and 38 (7.6%) had social problems. Twenty-nine (5.8%) of the senior citizens had a caregiver; 21 caregivers (72.4%) spent more than 12 hours caring for the elderly adult and were a family member, 22 (75.8%) received payment, and only 9 (31%) exclusively cared for the elderly adult.

In the year immediately preceding the study, 188 participants (37.5%) received an influenza vaccine, and 30 (6%) received a pneumococcal vaccine; 22% of respondents reported episodes of acute infection in this previous year, with 84 (16.7%) urinary tract infections, 16 (3.1%) cases of pneumonia, and 10 (1.9%) cases of tuberculosis. Regarding the presence of chronic illnesses, the most common was hypertension in 205 participants (40.9%), followed by rheumatism in 185 (36.9%) and dyslipidemia in 119 (23.8%); the prevalence of these conditions by age is shown in Table 2.

With respect to unhealthy habits, 48 senior citizens (9.5%) reported alcohol consumption, and 41 (8.2%) used tobacco. Regarding the distribution of activities in their free time, 443 senior citizens were evaluated, and 278 (62.7%) of them were found to perform unpaid domestic activities, 133 (30%) performed paid activities outside the home, and 32 (7.2%) engaged in unpaid nondomestic activities.

Concerning the self-perception of health, of the 497 people surveyed who responded, 303 (61%) categorized their health as normal, 79 (16%) as poor or very poor, and 115 (23%) as good or very good; 65.8% (330) had some kind of health insurance, and in the event of health problems, 365 (72.8%) attended some public sector healthcare institution, 85 (17%) attended a private healthcare institution, 39 (8%) visited another healthcare institution, and 12 (2.3%) did not go to any healthcare institution. Of those who did not seek medical attention, 6 (50%) did not do so because of a lack of money. The use of at least one pharmaceutical drug in the 6 months preceding the study was reported by 323 (64%) of the senior citizens. The prevalence of geriatric syndromes and problems by age groups is presented in Table 3.

Table 3. Geriatric syndromes and problems in elderly people in the community of the San Martín de Porres District

Variables	Total		60 to 69 years		70 to 79 years		80 years or older	
	n	(%)	n	(%)	n	(%)	n	(%)
Edentulism (n=501)	430	(85.8)	198	(82.8)	143	(86.7)	89	(91.8)
Insomnia (n=501)	358	(71.5)	171	(71.5)	123	(74.5)	64	(66.0)
Sensory deprivation (n=501)	328	(65.5)	175	(73.2)	106	(64.2)	47	(48.5)
Social risks and problems (n=501)	293	(58.5)	129	(54.0)	97	(58.8)	67	(69.1)
Falls (n=501)	179	(35.7)	73	(30.5)	62	(37.6)	44	(45.4)
Risk of and malnutrition (n=501)	147	(29.3)	57	(23.8)	47	(28.5)	43	(44.3)
Dependence (n=501)	139	(27.7)	44	(18.4)	48	(29.1)	47	(48.5)
Incontinence (n=499)	121	(24.2)	44	(18.4)	50	(30.3)	27	(27.8)
Frailty (n=446)	72	(16.1)	11	(4.8)	30	(21.4)	31	(40.3)
Cognitive impairment (n= 501)	81	(16.2)	13	(5.4)	30	(18.2)	38	(39.2)
Depression (n=501)	42	(8.4)	19	(7.9)	16	(9.7)	7	(7.2)

The average walking speed was 1 ± 0.3 m/s and was significantly less in the dependent elderly compared to the independent elderly (0.85 versus 1.1 m/s, p < 0.001), in the frail versus nonfrail elderly (0.54 vs. 1.1 m/s, p < 0.001), and in those who had perception of poor or very poor health as compared to those who had perception of good or very good health (0.88 vs. 1.1 m/s, p < 0.001). The timed up & go test showed average performance time of 13.9 seconds (± 15.6), and the average time required to perform the test was significantly greater in the dependent elderly in comparison with independent elderly (18.5 vs. 13.5 s, p = 0.041), and in the frail versus nonfrail elderly (24.8 vs. 12.7 s, p < 0.001).

DISCUSSION

The elderly from the community of the district that was evaluated here show higher prevalence of self-reported chronic diseases compared to reported acute infectious diseases in the previous years. We found that the most common chronic disease is hypertension, with prevalence not far from that reported in the Tornasol study in 2006 [23], which showed prevalence of 52.4% at the national level in people between 60 and 69 years of age and 47.1% in those over 80 years of age. Furthermore, one study [4] attributes 58% of the causes of the disease burden to noncommunicable diseases, with similar frequencies of neuropsychiatric, cardiovascular, neoplastic, and musculoskeletal diseases. Huicho *et al.* [24] evaluated the mortality profile of our country, considering the demographic transition between 1996 and 2000, and found a shift in mortality from communicable causes to noncommunicable causes, with more than a half of the causes of mortality in our country attributable to the latter. Ultimately, given that chronic conditions affect a large proportion of the elderly population, this group is more affected by these diseases and contributes to their overall frequency the most.

Our study shows that the majority of senior citizens do not have positive self-perception of health, and if they have a health problem, they prefer to visit a public healthcare institution; a small percentage does not apply to any healthcare provider. The SABE study (survey on health, well-being, and aging) [8] in Latin America and the Caribbean yielded similar results, where the prevalence of normal or poor health was quite high, over 60%, the figure that can be explained by health determinants as well as cultural idiosyncrasies, in addition to gender inequalities, because the self-report profile of men appears to be better than that of women. Another study, Abellán [25], is in agreement with this analysis of the perception of health states, namely, the factors related to a worse health report are the following: older age, being female, a low level of education, lower income, and an unhealthy lifestyle.

The proportion of the elderly in this study who do not use healthcare services is low, likely because a few years ago Comprehensive Health Insurance [26] was implemented, which offers comprehensive services to underprivileged populations, overcoming the barrier posed by the cost of provision of the said services. This was a result of INTRA III study [27] (Developing integrated responses of health care systems for a rapidly aging population), which was carried out in our country earlier and revealed that the main reason why the elderly population did not visit these primary healthcare institutions was insufficient economic resources.

Regarding geriatric syndromes and problems, we found that they are frequent, with higher rates among people over 80 years of age. The physical performance evaluation as well as the walking speed and timed up & go test showed high rates of frailty and risk of falling, in line with other studies [6,7], which revealed conditions of increased vulnerability by analyzing adverse effects [6]. Additionally, the elevated prevalence rates of edentulism, insomnia, sensory deprivation, social problems, and a risk of social problems directly influence the self-perception of poor health in our results. There is a mutual relation between social and family support and the physical and mental health of family members [28]. We found that more than a half of the respondents were at risk of social problems or had social problems, and close to a quarter had a dysfunctional family. These findings are alarming because a family environment is where early interventions into the health problems of the elderly start.

We found 28% of the participants to have some level of functional dependency, which in turn was significantly more frequent among those older than 80 years of age. The factors associated with the development of functional dependency are age and health as well as economic and social conditions of the person in the community [29]. The frequency of cognitive impairment was 16.2%, higher among those more than 80 years old. The prevalence of depression was 8.4%, in agreement with the Mental Health Study [30] carried out in Lima and in other parts of Peru. The determinants of successful aging are preservation of functionality, participation, and safety. Therefore, our data on dependence, cognitive impairment,

and depression reveal not only a public health problem but also a challenge for the community: the latter should try to preserve the health of healthy elderly people and those at risk of developing a disorder [5].

The nutritional status assessment detected malnutrition and a risk of malnutrition in almost a third of the elderly people tested. Even though there is no "gold standard" for the assessment of the nutritional status of the elderly, the MNA is an accepted, sensitive, specific, and early detection instrument [31]. Among the parameters measured in the laboratory, averages of Hb and albumin were within the reference ranges but were significantly lower in people of advanced age; this finding is consistent with the nutritional deterioration that we uncovered. This pattern was also reported in other studies [32] and is caused by a higher frequency of geriatric syndromes and disorders that directly affect nutrition such as poor oral health, sensory deprivation, depression, and a lack of access to healthy and nutritious food. These findings confirm the need to take care of the nutritional status of the elderly, considering all of the described factors involved, by means of multidisciplinary interventions, in order to improve the nutritional status of these people.

The strength of this study is that it is the first in our country to comprehensively describe characteristics of the elderly in the community. Our study involves a representative sample from one of the most densely populated districts in Lima; a series of geriatric, sociofamilial, and laboratory variables are included in addition to the classic clinical variables. Limitations include the recall bias, which can affect results because some of our measurements involved self-reporting. Nevertheless, the study was designed so that the data were corroborated continually (in doubtful cases) by a present family member, and such that the results came from a specific segment of the population. Therefore, our findings cannot be extrapolated to the elderly population of our country. It is therefore necessary to perform studies in this population group at the national level such as the Survey on Health, Well-being and Aging in Peru (SABE-PERU), which has already been approved to take place in this country soon.

We can conclude that in the San Martín de Porres District, the elderly population is predominantly female and has frequent problems with functional dependence, social problems or a risk of social problems, prevalent chronic diseases, and high prevalence of geriatric problems and syndromes.

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References

1. Naciones Unidas. Proyección de la población. Observatorio demográfico. América Latina y el Caribe. CELADE- CEPAL, 2007;(3):14-16
2. Instituto Nacional de Estadística e informática. Estado de la Población peruana 2014. Lima: INEI; 2014.
3. Málaga G. Las enfermedades crónicas no transmisibles, un reto por enfrentar. Rev Peru Med Exp Salud Publica. 2014;31(1):6-8.
4. Velásquez A. La carga de enfermedad y lesiones en el Perú y las prioridades del plan esencial de aseguramiento universal. Rev Peru Med Exp Salud Publica. 2009;26(2):222-31
5. Varela L. Valoración geriátrica integral y síndromes geriátricos. En: Varela L. Principios de Geriatría y Gerontología. 2da Ed: Lima; Universidad Peruana Cayetano Heredia; 2011. p. 195-216.
6. Varela Pinedo L, Ortiz Saavedra PJ, Chávez Jimeno H. Velocidad de la marcha como indicador de fragilidad en adultos mayores de la comunidad en Lima, Perú. Rev Esp Geriatr Gerontol 2010;45(1):22-5. doi: 10.1016/j.regg.2009.07.011.
7. Gálvez M, Varela L, Chavez H, Cieza J, Mendez F. Correlación del Test "Get Up And Go" con el Test de Tinetti en la evaluación del riesgo de caídas en los adultos mayores. Acta med peruana 2010;27(1):8-11
8. Albala C, Lebrão ML, León Díaz EM, Ham-Chande R, Hennis AJ, Palloni A, *et al.* Encuesta Salud, Bienestar y Envejecimiento (SABE): Metodología de la encuesta y perfil de la población estudiada. Rev Panam Salud Pública 2005;17(5-6):307-22.
9. Pfeiffer E. A short portable mental status questionnaire for the assessment of organic brain deficit in elderly patients. J Am Geriat Soc. 1975;23(10):433-41.
10. De la Torre J, Shimabukuru R, Varela L, Kruger H, Huayanay L, Cieza J. *et al.* Validación de la versión reducida de la escala de depresión geriátrica en el consultorio externo de geriatría del Hospital Nacional Cayetano Heredia. Acta Médica Per 2006;23(3):144-146

11. Yesavage JA, Brink TL, Rose TL, Lum Q, Huang V, Adey M, *et al*. Development and validation of a geriatric depression screening scale: a preliminary report. J Psychiatr Res 1982;17(1):37-49
12. Mahoney FI, Barthel DW. Functional evaluation: the Barthel Index. Md State Med J. 1965;14:61-65
13. Cabrera D, Ménendez A, Fernández A, Acebal V, García JV, Díaz E, *et al*. Evaluación de la fiabilidad y validez de una escala de valoración social en el anciano. Aten Primaria 1999;23(7):434-40.
14. Instituto Nacional de Estadística e informática-Fondo de población de las naciones unidas. Perú: Tipos y ciclos de vida de los hogares 2007. Lima: INEI; 2010.
15. Good M, Smilkstein G, Good B, Shaffer T, Arons T. The family APGAR index: A study of construct validity. Journal of Family Practice. 1979;8:577-82
16. Instituto Nacional de Estadistica e informática-Ministerio de la Mujer y desarrollo social. Encuesta Nacional del uso del Tiempo 2010. Principales resultados. Lima: INEI; 2011.
17. Ministerio de Salud de Perú. Guía de práctica clínica para la prevención y control de la enfermedad hipertensiva en el primer nivel de atención. RM 491-2009. Lima: Ministerio de Salud; 2009.
18. Instituto Nacional de Salud. Guía técnica para la valoración nutricional antropométrica de la persona adulta mayor. Lima: INS; 2013.
19. Guigoz Y, Vellas B, Garry PJ. Assessing the nutritional status of the elderly: The Mini Nutritional Asssessment as part of the geriatric evaluation. Nutr Rev 1996;54(1 Pt 2):S59-65
20. Organización Panamericana de la Salud. Módulos de valoración clínica. Valoración nutricional del adulto mayor. Washington, D.C: OPS/OMS; 2002.
21. National Cholesterol Education Program (NCEP) Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III). Third Report of the National Cholesterol Education Program (NCEP) Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III) final Report. Circulation. 2002;106(25):3143-421
22. Petersen JL, McGuire DK. Impaired glucose tolerance and impaired fasting glucose review of diagnosis, clinical implications and management. Diab Vasc Dis Res. 2005;2(1):9-15
23. Segura L, Agusti R, Parodi J, Investigadores del estudio Tornasol. Factores de riesgo de las enfermedades cardiovasculares en el Perú (Estudio TORNASOL). Rev Peru Cardiol. 2006;32(2):82-128
24. Huicho L, Trelles M, Gonzales F, Mendoza W, Miranda J. Mortality profiles in a country facing epidemiological transition: An analysis of registered data. BMC Public Health 2009;9:47. doi: 10.1186/1471-2458-9-47.
25. Abellán A. Percepción del estado de salud. Rev Mult Gerontol. 2003;13(5):340-42.
26. Ministerio de Salud. Ley Marco de Aserguramiento Universal en Salud y su Reglamento. Ley 29344. DS 008-2010-SA. Ministerio de Salud, Lima, 2011.
27. Varela L. Desarrollando respuestas integradas en sistemas de salud de una población en rápido envejecimiento. INTRA III. Lima; UPCH-OPS/OMS; 2005.
28. Takase L, Mendes M, Manoele M, Modesto S, Zunino R. The family dynamics of elder elderly in the context of Porto, Portugal. Rev Latin-Am Enfermagem 2011;19(3):458-66. doi.org/10.1590/S0104-11692011000300003.
29. Rodrigues MA, Facchini LA, Thumé E, Maia F. Gender and incidence of functional disability in the elderly: a sistematic review. Cad Saúde Pública 2009;25(S3): S464-76
30. Instituto Nacional de Salud Mental Honorio Delgado - Hideyo Noguchi. Estudio Epidemiológico de la Salud Mental en Fronteras 2005. Informe general. Anales de Salud Mental. 2006;22(1-2):5-223
31. Calderón Reyes ME, Ibarra Ramírez F, García J, Gómez Alonso C, Rodríguez-Orozco AR. Evaluación Nutricional comparada del adulto mayor en consultas de Medicina Familiar. Nutr Hosp 2010;25(4):669-75.
32. Tarqui-Mamani C, Alvarez-Dongo D, Espinoza-Oriundo P, Gomez-Guizado G. Estado nutricional asociado a características sociodemográficas en el adulto mayor peruano. Rev Peru Med Exp Salud Publica 2014; 31:467-72.

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