

SOCIO-DEMOGRAPHICS CHARACTERISTICS AND HEALTH CONDITIONS OF OLDER HOMELESS PERSONS OF LIMA, PERU

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ABSTRACT

Objectives. Determine the socio-demographics characteristics and health conditions of older homeless persons at the time of enrollment into the National Program "Vida Digna" and the probability of functional dependency by age, and stratified by gender and cognitive impairment. **Materials and methods.** We performed a cross sectional study, reviewing all registration forms of the program in order to identify socio-demographic variables and health conditions of older homeless persons at the time of enrollment in the program. We did a descriptive analysis of the socio-demographic variables and we also determined the frequency of health conditions. Furthermore, we determined the probability of functional dependency by age, and stratified by gender and cognitive impairment through a logistic regression model. **Results.** The older homeless persons at the time of enrollment in the program were mostly single men, with a primary education or no education. The study subjects had a high frequency of chronic and mental diseases. 50% of them had certain level of functional impairment and roughly 70% had a certain level of cognitive impairment. The probability of functional dependency increased by age, and it was higher in women than in men. This probability increased according to the level of cognitive impairment. **Conclusions.** This study shows that older homeless persons are a vulnerable population not only because they live outdoors but also because they have also for the high prevalence of chronic and mental diseases. These diseases prevent the homeless persons from living by themselves special care to overcome their situations.

Key words: Elderly; Homeless person; Aging; Mild cognitive impairment (source: MeSH NLM).

INTRODUCTION

Aging is a natural and irreversible physiological process. It is a triumph of modern healthcare policies that people live longer lives ⁽¹⁾. This situation results in new challenges for the Peruvian government, who must provide the necessary services for the protection and care of senior citizens so that they may live longer with good quality of life. In this sense, the government must create public policies guaranteeing that older people lead pleasant, active, and independent lives within their families and communities ^(2,3).

Unfortunately, there is a group of senior citizens who are invisible to society, live in highly hazardous social situations, and are constantly at risk, who have been excluded and disconnected from their families, and are often not respected in their social environment ⁽²⁾. This group are homeless senior citizens (PAMSCs, Spanish acronym) who not only live in extreme poverty but under nearly inhumane conditions ⁽⁴⁻⁶⁾, without a home or basic utilities, no satisfaction of basic needs, no access to health care or recreation, abandoned and forgotten by their families and the government ⁽⁷⁻⁹⁾.

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Received: 4/10/2015 Approved: 7/23/2015

Homeless people, aside from the normal deterioration that comes with age, are also at an unacceptably high risk of preventable diseases (pneumonia, influenza), addictions (drug addiction, alcoholism), victimization (sexual assault), progressive morbidity (e.g., chronic diseases, cancer), and life expectancy below the national average^(4,10).

Currently, there is solid evidence for the success of social programs for homeless individuals⁽¹¹⁻¹³⁾. This evidence indicates that shelter and adequate management of homeless people lead to social reintegration, reduced numbers of visits to emergency rooms and hospitalizations due to fewer complications, addiction control, and above all, increased life expectancy and improved quality of life⁽¹⁴⁻²⁰⁾.

One of the decisive factors for the social/familial reintegration of homeless people, especially senior citizens, is their degree of functional and cognitive independence, that is, their ability to execute basic activities of daily living (ADL) such as getting dressed, eating, or bathing; this parameter encompasses the concept of instrumental ADL (IADL), such as shopping or preparing food⁽²¹⁾.

In 2012, the Peruvian government, in an effort to address this problem, created the National Decent Life Program (Programa Nacional de Vida Digna; PNVD) in order to restore and protect the rights of PAMSCs. The PNVD offers restoration of their right to identity, access to the Comprehensive Healthcare System (SIS, Spanish acronym), permanent or nocturnal shelter, food, clothing, and age-appropriate care⁽²²⁾. The PNVD currently serves 457 PAMSCs in the cities of Lima, Arequipa, Huaraz, and Huanuco.

In Peru, despite the government's efforts to address this problem, little is known about the above-mentioned group of people because they are a mobile segment of the population and hard to approach. For this reason, with the goal of obtaining evidence to help implement better public policies for preventing and overcoming this problem, the objective of this study was to determine the sociodemographic and basal health characteristics of PAMSCs by analyzing PNVD beneficiaries at the time of admission into the said program. In addition, we determined the probability of functional dependence due to age and stratified the data by gender and cognitive impairment.

MATERIALS AND METHODS

STUDY DESIGN

We conducted a cross-sectional study, where we reviewed PNVD archives to find the following sources of data: initial contact sheets, an economic assessment sheet, health sheet, and social and psychological reports for each PNVD beneficiary.

STUDY AREA AND POPULATION

This study was conducted on homeless adults over 60 years old who entered the PNVD between 2012 and June 2014 at all locations of the program (Lima, Peru) and who were housed at some Residential Care Center for Senior Citizens (CARPAM, Spanish acronym) or some guest house at the national level. CARPAMs offer permanent accommodations, nursing care, clothing, full meals, and health care. By contrast, guest houses offer overnight accommodations, clothing, food, and health care. Both services also offer workshops and recreational activities to strengthen abilities that optimize the aging process.

DATA COLLECTION

Between June and July 2014, PNVD archives were analyzed to identify the sources of information and to determine the baseline of the program in terms of the characteristics of the beneficiaries. We identified five sources of information, which are described below.

The initial contact sheet is filled out by PNVD workers who are in charge of approaching homeless senior citizens in order to encourage them to leave the streets and invite them to the PNVD. This sheet contains demographic information (age, gender, educational level, marital status, and place of birth), whether they have a national ID, where they sleep, whether they have relatives and some type of insurance, or whether they have some disease. This sheet serves as a screening procedure to identify potential PNVD beneficiaries. It also collects self-reported information about the beneficiary's health.

The economic assessment sheet evaluates the type of job they have and whether they are affiliated with some sort of social program. The health sheet makes an overall assessment of the beneficiary's health and dependence/independence status through KATZ's index of independence. This test evaluates the degrees of dependence or independence using six basic functions: bathing (a sponge, shower, or tub), getting dressed, using the toilet, mobility, continence, and eating⁽²³⁾. In this test, each

activity is classified into three categories: independence, partial dependence, and complete dependence.

According to KATZ's index, a person is considered independent when he or she does not need help or needs help only for one component of the activity; someone is considered completely dependent when they need someone else's help, including supervision or guidance, for all components of the activity. Finally, someone is partially dependent when they "require assistance" for more than one component but can carry out other components of the activity without help or supervision ⁽²⁴⁾.

The social evaluation determines whether the person indeed meets the established PAMSC profile, whether they are socially excluded (essential requirement to enter the PNVD); and the psychological sheet evaluates, among other parameters, cognitive status by Pfeiffer's test, and the emotional status according to the Yesavage Geriatric Depression Scale. Pfeiffer's test evaluates cognitive impairment by means of a 10-item questionnaire on a small number of relatively basic functions (short- and long-term memory, attention, orientation, information about daily events, or mathematics proficiency) ⁽²⁵⁾.

This scale categorizes the cognitive level as follows: normal cognition, mild cognitive impairment, moderate (pathological) cognitive impairment, and severe cognitive impairment.

Yesavage's scale is applied to the elderly and is focused on assessing the affective state, that is, geriatric depression ⁽²⁶⁾. It is important to keep in mind that the results of these tests were collected from the aforementioned sheets.

DATA ANALYSIS

The information from the different sheets was entered into a Microsoft Excel database and converted to CSV format for analysis by means of the epicalc package of the R programming language ⁽²⁷⁾. To protect personal information of the PNVD beneficiaries, names and last names were encrypted and were assigned an identification code.

We performed a descriptive analysis based on the frequency distribution of the main sociodemographic variables, such as gender, education level, and marital status. We also calculated the median and the minimal and maximal values for the age variable. We determined the relative frequency of physical and mental disorders

in the subjects as well as their dependence status and mental state.

We determined the probability of partial dependence (there were no completely dependent beneficiaries) by age and by gender, by means of a logistical regression model. Finally, we determined the probability of partial dependence by age and degree of cognitive impairment.

ETHICAL CONSIDERATIONS

This study's protocol was approved by the Executive Directorate of the National Decent Life Program (permission to review their archives). To ensure confidentiality of the beneficiaries' personal information, we did not record any information that could identify them and instead used identification codes.

RESULTS

We collected information from 348 PNVD beneficiaries, and 46 were excluded for not knowing or being uncertain about their age, or if they were under 60 years old (one of the criteria for entering the PNVD is being older than 60) or over 100 years old (a probable error in the record).

The median of age of the beneficiaries at the time of admission into the PNVD was 72 years, and most (82.8%) were males. Regarding the education level, 37.8% had completed or attended primary school, and 10.9% attended no classes. It should be pointed out that 8% had college education. Most of the beneficiaries were single (69.6%), whereas only 15.8% were married. There are many ways in which PAMSCs are identified and referred to the PNVD. In our case, most PAMSCs were identified or referred by program facilitators (65.6%) or by other institutions such as police (7.4%). Only 5% came of their own accord (Table 1).

Until June 2014, 47.7% of the PNVD beneficiaries were staying at a CARPAM or using the guest house service (25.7%); 19% and 7% had left the PNVD or died, respectively (Table 1).

Regarding the family network of the PAMSCs, only 29 (9.6%) of them had some kind of a close relative. Among their close relatives, 15 (5.0%) were children, 9 (3.0%) were siblings, and 3 (1.0%) were nephews or nieces (data not included in Table 1).

We found that 66.2% of the PAMSCs had some chronic disease at the time of admission into the PNVD, e.g., hypertension (14.2%), arthritis/osteoarthritis (7.6%), or diabetes mellitus (5.6%). Some of them also had a history of infectious diseases, such as syphilis (5%) or

Table 1. Sociodemographic characteristics of the beneficiaries of the National Decent Life Program (PNVD)

Characteristics	n	(%)
Age upon admission (years)* (n = 302)	72	(60-96)
Gender(n=302)		
Male	250	(82.8)
Female	52	(17.2)
Level of education (n=238)		
No education	26	(10.9)
Incomplete elementary school	27	(11.3)
Completed elementary school	63	(26.5)
Incomplete high school	16	(6.7)
Completed high school	83	(34.9)
Technical higher education	4	(1.7)
College education	19	(8.0)
Marital status (n=240)		
Single	167	(69.6)
Married	38	(15.8)
Widowed	26	(10.8)
Divorced	2	(0.9)
Separated	7	(2.9)
Method of PAMSC identification (n=299)		
Facilitator	196	(65.6)
National Peruvian Police	22	(7.4)
Civil society	21	(7.0)
Via telephone by any citizen	17	(5.7)
Prosecutor's office	11	(3.7)
Own request	15	(5.0)
Hospital	8	(2.7)
Municipality	4	(1.3)
Charity organization	4	(1.3)
Ombudsman	1	(0.3)
Current circumstances of the PAMSC (n=300)		
Staying at CARPAM	143	(47.7)
Guest house service	77	(25.7)
Left the facility	57	(19.0)
Deceased**	23	(7.6)

* Median (minimum-maximum), ** Between the start of the program and June 2014. PAMSC: homeless senior citizen

tuberculosis (2.9%; Table 2). It should be noted that many of the PAMSCs had several diseases simultaneously. In addition, some of the PAMSCs had problems with alcohol or drugs such as marijuana or cocaine paste. Furthermore, 48.9% of the PAMSCs were partially dependent upon admission into the PNVD.

Mental disorders were also prevalent in this group of vulnerable people: 27.8% of them had some type of

mental or neurological disorder at the time of admission into the PNVD, mainly senile dementia (10.3%), some type of schizophrenia (6%), or Parkinson's disease (3%). Finally, 23.2% and 12.5% of the PAMSCs showed moderate and severe cognitive impairment, respectively, at the time of admission into the PNVD (Table 2).

The social and family assessment of the PAMSCs revealed that all of them were at risk of social problems because of the absence of support by their families or a social support network. Furthermore, Yesavage's test showed that all of the PAMSCs were depressed to some extent (data not shown in Table 2).

Table 2. Physical and mental health of the beneficiaries of the National Decent Life Program (PNVD)

Physical and mental health	n	(%)
Chronic diseases reported at the time of admission (n=302)		
Yes	200	(66.2)
Prevalence of chronic diseases (n=302)		
Arterial hypertension	43	(14.2)
Arthritis or osteoarthritis	23	(7.6)
Diabetes <i>mellitus</i>	17	(5.6)
Chronic malnutrition	14	(4.6)
Sequelae of cerebrovascular disease	14	(4.6)
Chronic renal failure	2	(0.7)
Prevalence of infectious diseases (302)		
Syphilis (positive results of VDRL test)	15	(5.0)
History of tuberculosis	9	(2.9)
Viral hepatitis B or C	5	(1.6)
HIV/AIDS	2	(1.0)
Prevalence of legal and illegal drug use (n=302)		
Consumption of alcohol	48	(19.1)
Use of marijuana/cocaine paste	9	(3.0)
Functional assessment (KATZ's test) (n=280)		
Independent	143	(51.1)
Partially dependent	137	(48.9)
Misreported mental disorder at the time of admission (n=307)		
Yes	84	(27.8)
Prevalence of mental or neurological disorders (n=302)		
Senile dementia	31	(10.3)
Schizophrenia	18	(6.0)
Parkinson's disease	9	(3.0)
Psychotic disorders	4	(1.3)
Intellectual disability	2	(0.7)
Bipolar disorder	2	(0.7)
Assessment of mental condition (Pfizer's test) (n=280)		
Normal cognition	94	(33.6)
Mild cognitive impairment	86	(30.7)
Moderate cognitive impairment	65	(23.2)
Severe cognitive impairment	35	(12.5)

PAMSC: homeless senior citizen

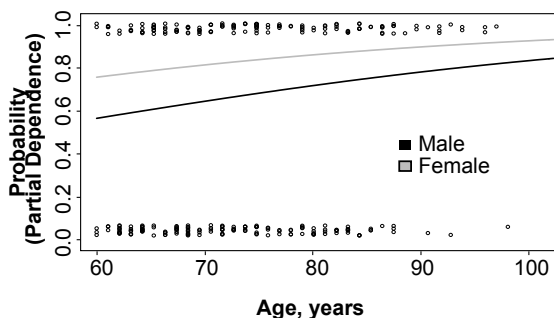


Figure 1. Likelihood of partial dependence as a function of age, stratified by gender, among the National Decent Life Program beneficiaries

The probability of partial dependence increased with age, both among men and among women. Additionally, women were found to be more likely than men to become partially dependent (Figure 1). For example, the likelihood of partial dependence increased from 0.75 at 60 years of age to nearly 0.90 at 80 years of age. By contrast, the likelihood of partial dependence in men increased from 0.6 at 60 years of age to nearly 0.70 at 80 years of age.

The likelihood of partial dependence increased with age for all degrees of cognitive impairment, except for severe cognitive impairment, where the likelihood of partial dependence was close to 1.0 at all ages. On the other hand, partial dependence increased with the severity of cognitive impairment (Figure 2). For example, in PAMSCs without cognitive impairment, the likelihood varied between 0.4 and 0.5 between 60 and 80 years of age, whereas among PAMSCs with cognitive impairment, this likelihood varied between 0.6 and 0.7 between 60 and 80 years of age. Among PAMSCs with moderate cognitive impairment the likelihood varied between 0.8 and 0.95 within this age range.

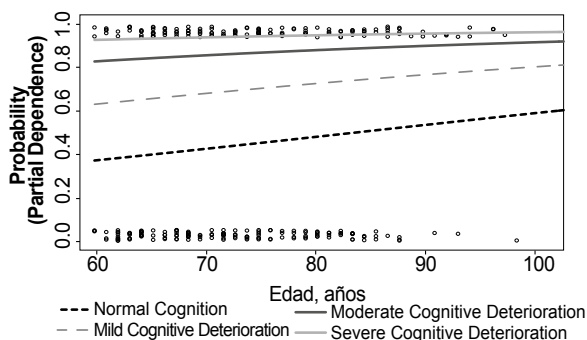


Figure 2. Likelihood of partial dependence as a function of age, stratified by the level of cognitive impairment, among the National Decent Life Program beneficiaries

DISCUSSION

Thus study shows that PAMSCs admitted to the PNVD are mostly are male, single, and have an education level of primary school or below. These PAMSCs show high prevalence of chronic diseases, some of the most salient ones being hypertension, arthritis or osteoarthritis, and diabetes mellitus. They also show high prevalence of mental and neurological disorders such as senile dementia, schizophrenia, and Parkinson’s disease.

Furthermore, the results of this study show that nearly 50% of the PAMSCs admitted to the PNVD are partially dependent, and nearly 70% show some degree of cognitive impairment. Finally, the probability of partial functional dependence increases with age, and we found that this probability is higher among women than among men; in addition, this probability increases greatly with the severity of cognitive impairment.

This study has the following limitations: 1) Because the data were collected from the PNVD registration sheets, our results may underestimate the actual data (not accurate results), mainly in relation to the prevalence of chronic diseases and mental/neurological disorders because this information does not come from an exhaustive medical examination but rather from the report of the PAMSC or from an assessment by the PNVD employees who are not healthcare professionals. Despite this problem, there are diseases (such as the ones we mentioned above) that are easily recognizable by both the patient and the PNVD employees, especially in senior citizens. 2) Another significant limitation is that persons with cognitive impairment and mental disorders cannot provide accurate data. 3) The information about age may be inaccurate, mainly among persons who cannot provide this information or refuse to do so. It is difficult to estimate age in this group of people during a general physical examination because many of them look older than they are due to the bad living conditions. In many cases, the real age is identified after the PAMSC has entered the PNVD, and some trust has been established between the PAMSC and the PNVD team, or when the information is verified by the National Register of Identification and Civil Status (RENIEC, Spanish acronym). This is also true for the data on relatives.

A common technology for obtaining information and for identification of homeless people is a census or registry, which are population studies focused on a specific geographic area, such as a city. This was the case for

the census in Medellin, Colombia, in Mexico City, and in El Alto in Bolivia; these projects can even encompass an entire country, such as the registries compiled in Chile in 2005 and 2011. These studies showed the same demographic pattern (predominance of single males) and educational pattern (primary education or less) for PAMSCs as in our study^(7-9,28). This pattern may be explained as follows: single males have fewer familial connections, and the low educational level prevents them from finding well-paid jobs that can provide for their basic needs.

This study shows the importance of PNVD promoters for identification and enrolling of PAMSCs as well as the usefulness of other governmental and civil-society agencies because PAMSCs are difficult to identify and approach due to their high mobility and evasion of authorities; in many cases, a census or registry can help to identify PAMSCs^(29,30).

Undoubtedly, this particular group of senior citizens shows higher prevalence of chronic diseases, mental disorders, infectious diseases, and alcohol and drug abuse than does the general population of senior citizens^(2,4,31). Unfortunately, due to the limitations of self-reporting, in some cases, these prevalence values are below what is expected for senior citizens, as is the case for hypertension⁽³¹⁾.

Censuses and registries in our continent do not include health information, which is why we cannot compare our results to other studies continent-wide; therefore, we will compare our results to those of the Health, Welfare and Aging Survey (SABE, Spanish acronym) conducted in several Latin American and Caribbean countries⁽³¹⁾ among the elderly. For example, the SABE study indicates that, on average, the prevalence of chronic diseases varies between 10% and 40% among 60- to 80-year-olds, whereas in our study, it was 66.2%. That study also indicated that prevalent diseases at this life stage are hypertension, cardiovascular disease, arthritis, and diabetes, in line with the results of our study. Here, mental disorders were found to be more prevalent than in the SABE study⁽³¹⁾; overall, the prevalence of mental disorders among PAMSCs at the time of admission into the PNVD is ~30%. In contrast, according to the SABE study, the prevalence of depression varies between 5% and 20% (in our study it is 100%). Our findings differ from those of studies conducted on PAMSCs in other zones: in the United States, Australia, and Europe, where the

prevalence of depression varies between 50% and 60%, and the prevalence of mental disorders is 61%^(4,32,33).

The authors of the SABE study also assessed functional dependence and found that between 10% and 25% of senior citizens have at least some kind of difficulty with ADLs and IADLs⁽³¹⁾. Here, we found that 50% of these people have partial functional impairments. In addition, the frequency of cognitive impairment is fourfold higher among PAMSCs than among the senior citizens surveyed by the SABE. Our results match those of other studies on the same homeless population⁽³⁴⁾.

Another important result of this study is the finding that partial functional impairment is directly related to age and the degree of cognitive impairment, in agreement with research on aging^(11,35). Our study also shows that women are much more dependent than men because women show a higher probability of functional impairment, probably because they have higher prevalence of arthritis, osteoarthritis, and osteoporosis among other illnesses⁽³¹⁾.

This study, despite the limitations due to its cross-sectional design and the review of registration sheets, provides information that is valuable not only for the PNVD but also for the Peruvian government and society at large because our results represent the first sociodemographic description and identify the physical- and mental-health problems among PAMSCs in Peru. Fortunately, these problems are being addressed by the government through the PNVD. We also demonstrated that functional impairment and cognitive impairment are useful metrics for the PNVD because the care and services provided to this vulnerable group of people depend on these parameters, as does the distribution of the budget that helps to fulfill the relevant needs.

Although this study provides data on PAMSCs, it is necessary to conduct further research to elucidate the reasons why these Peruvians end up living on the streets. It is also necessary to organize initiatives for evaluation of the cost-effectiveness of social programs for vulnerable populations such as homeless senior citizens.

The results of this study may help to increase the continuity and scale and to enhance advocacy for social programs whose objective is to improve the rights and living conditions of this highly vulnerable group of Peruvians.

Author Contributions: MMR and CVM contributed to the conception of the study and writing of the manuscript. MMR obtained the funding. EL and MD collected the data and reviewed the manuscript. CVM performed the data analysis.

Sources of Funding: this study was funded by the PNVD of the Ministry for Women and Vulnerable Populations (MIMP, Spanish acronym).

Disclaimers: the contents of this manuscript are the sole responsibility of its authors and do not necessarily represent the official opinion of the PNVD of the MIMP.

Conflicts of Interest: the authors declare that they do not have any conflicts of interest.

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