ORIGINAL ARTICLE

The feeling of loneliness among the elderly population attending day care centers in Bogotá, Colombia

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ABSTRACT

Objective: To identify the factors associated with the categories of loneliness among the elderly population attending day care centers in Bogotá, Colombia.
Materials and methods: An analytical, cross-sectional and quantitative study was carried out to measure the loneliness among older people attending a day care center in the city of Bogotá between November 2020 and June 2021 using the ESTE scale. To meet the objective, a univariate descriptive statistical analysis was performed, such that, for the quantitative variables, the mean with standard deviation or median with interquartile ranges were used, in accordance with the Shapiro-Wilk test for normality, and for the categorical variables, absolute frequencies and proportions were used. The bivariate analysis was conducted using Student's *t*-test and chi-square test ($p < 0.05$), which contributed to build a logistic regression model with statistically significant variables.
Results: A total of 215 elderly people with a mean age of 70.5 years were included in the study: 72 % were females, 56.5 % had primary education, 38.6 % were single and 67.4 % had a history of chronic non-communicable disease. According to the ESTE scale, the study subjects showed a low level of family loneliness (67 %), a high and medium level of marital loneliness (79 %), a high and medium level of social loneliness (51 %) and a high and medium level of adaptation crisis (43 %). It was found that marital loneliness was associated with females ($p = 0.001$), social loneliness with lower class ($p = 0.027$) and adaptation crisis with lower class ($p = 0.024$).
Conclusions: The factors associated with the feeling of loneliness among the elderly population attending day care centers are, in the marital loneliness category, being a woman and, in the social loneliness and adaptation crisis categories, belonging to the lower class.

Keywords: Loneliness; Aged; Chronic Disease (Source: MeSH NLM).

El sentimiento de soledad en la población adulta mayor participante en centros de día en Bogotá, Colombia

RESUMEN

Objetivo: Identificar los factores asociados a las categorías de soledad en población adulta mayor en centros de día en Bogotá, Colombia.
Materiales y métodos: Se realizó un estudio cuantitativo, transversal y analítico para medir la soledad en personas mayores que participan en un centro de día de la ciudad de Bogotá, mediante la escala ESTE en personas mayores, entre noviembre de 2020 y junio de 2021. Para cumplir con el objetivo, se realizó un análisis estadístico descriptivo univariado, de tal forma que, para las variables cuantitativas, se empleó media con desviación estándar o mediana con rangos intercuartílicos, de acuerdo con los criterios de normalidad utilizando la prueba Shapiro Wilk, y para las variables categóricas, frecuencias absolutas y proporciones. El análisis bivariado se realizó con las pruebas t de Student y chi cuadrado ($p < 0,05$), lo cual contribuyó a la construcción de un modelo de regresión logística, con las variables con significancia estadística.
Resultados: Se incluyeron 215 personas adultas mayores con promedio de edad de 70,5 años; 72 % correspondían al sexo femenino, 56,5 % tenían educación primaria, 38,6 % eran solteros y 67,4 % presentaban antecedente de enfermedad crónica no transmisible. Según la escala ESTE, en soledad familiar registraron nivel bajo (67 %); en soledad conyugal, entre nivel alto y medio (79 %); en soledad social, nivel alto y medio (51 %); en crisis de adaptación, nivel alto y medio (43 %). Se encontraron asociaciones en soledad conyugal con sexo femenino ($p = 0,001$), en soledad social con clase baja ($p = 0,027$) y en crisis de

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adaptación con clase baja (p = 0,024).
Conclusiones: Los factores que se asocian al sentimiento de soledad en población adulta mayor participante en centros de día son, en la categoría de soledad conyugal, ser mujer, y, en soledad social y crisis de adaptación, pertenecer a clase baja.

Palabras clave: Soledad; Anciano; Enfermedad Crónica (Fuente: DeCS BIREME).

INTRODUCTION

The dynamics of population aging worldwide has aroused interest in responding to the social and health needs of the elderly population due to the increased demand for health services [1,2]. According to ECLAC's Centro Latinoamericano y Caribeño de Demografía (CELADE – Latin American and Caribbean Demographic Centre) and the *World report on ageing and health* released by the World Health Organization (WHO), the Latin American and Caribbean population will account for three to five times the global population between 2025 and 2050, and its population over 65 years of age will be larger than that of children under 14 [3,4].

This process of population growth of the elderly is characterized by the increase in life expectancy, which gives rise to longer-lived populations who need more health and social care [2], the generation of challenges in dealing with the elderly, as well as the creation of healthy conditions or environments [5]. In the case of the Colombian population, according to the 2005 census conducted by Departamento Administrativo Nacional de Estadística (DANE - National Administrative Department of Statistics), people over 65 years of age made up 6.5 % of the population, and an increase of 20 % is projected for 2050 [6].

The elderly population is characterized by a burden of chronic non-communicable diseases (NCDs) such as ischemic heart disease, cerebrovascular disease and chronic obstructive pulmonary disease [7,8]. The prevalent morbidity in the elderly includes mental disorders, as stated by the Encuesta Nacional de Salud, Bienestar y Envejecimiento (SABE – National Survey on Health, Well-Being and Aging), where 40 % of the population have hypertension and symptoms of depression, the latter represented by a burden of mental disorders secondary to the typical changes and adaptations of old age [9-11].

Among the main phenomena in the elderly is loneliness, which is considered a multidimensional construct associated with mental health disorders. Similarly, pathologies related to the hypothalamic-pituitary-adrenal axis, such as cardiovascular risk, high blood pressure, high cholesterol, sleep disorders, migraine, altered immune function and effects on the transcription of some genes, can also be mentioned [12,13]. According to a systematic review conducted by Petitte et al., it was found that the feeling of loneliness has a prevalence of 20 % to 40 % in the elderly population [14].

Loneliness means feeling lonely, regardless of the number of social contacts [15]. There are different types of loneliness and some authors identify unwanted loneliness [16], whether objective or subjective. Rubio and Aleixandre [17], as well as Yaben [18], draw a distinction between being alone and feeling lonely. Objective loneliness refers to being alone, while subjective or emotional loneliness refers to feeling lonely. For this reason, it is necessary to assess subjective loneliness using different measurement scales [5].

Currently, there are loneliness assessment scales, including the UCLA Loneliness Scale, the Social and Emotional Loneliness Scale for Adults (SELSA), the Emotional/Social Loneliness Inventory (ESLI) and the Philadelphia Scale [19-21]. The Spanish ESTE scale, already validated in Colombia with a Cronbach's alpha of 0.90, consists of 30 items and measures family loneliness, marital loneliness, social loneliness and adaptation crisis. The research used self-administered Likert-type questions. The administration of such scale within the gerontological assessment will allow identifying and preventing the feeling of loneliness [19,20,22].

It is worth mentioning that loneliness in the elderly involves the intervention of different health disciplines which seek to promote people to be active subjects in their adaptation process during their lives, in order to contribute to reducing the burden of disease. It should be noted that loneliness has an impact not only on mental disorders but also on physical conditions [23], since it has been shown that self-care and adherence to treatment are diminished in people who experience this feeling.

The present study aimed at identifying the factors associated with the categories of loneliness in the elderly population attending day care centers in Bogotá, Colombia, to promote activities for the prevention of loneliness. It should be emphasized that preventing loneliness supports the aging process proposed by the Colombian policy on human aging and old age, as well as the increase in well-being in all areas of health of elderly people [24], and even

more in the framework of the decade of healthy aging 2020–2030.

MATERIALS AND METHODS

Study design and population

This is a descriptive, observational, analytical and cross-sectional study, where a characterization survey and the ESTE scale were administered to measure loneliness [19] in elderly people attending day care centers of Secretaría Distrital de Integración Social (SDIS - District Secretariat for Social Integration) in the city of Bogotá from November 2020 to June 2021.

Variables and measurements

The dependent variable was loneliness, which was assessed by the ESTE scale and presented as a dichotomous nominal qualitative variable. The ESTE scale consisted of 30 questions rated by a 5-point Likert scale with the following options: always, very often, sometimes, rarely and never. It included four categories of loneliness: family loneliness, marital loneliness, social loneliness and adaptation crisis. Family loneliness had four items, marital loneliness five, social loneliness eight and adaptation crisis thirteen. Conventionally, it is understood that the lower the score, the lower the risk of loneliness, with cut-off points that allow establishing low risk, medium risk and high risk. It was organized as a dichotomous variable: YES (medium and high risk), NO (low risk), according to the cut-off points [25]. As for the independent variables, sex (male or female), age (years), marital status (married, single, widowed, divorced and living common-law), educational level (no education, primary education, secondary education, technical education, professional education), socioeconomic status (upper, middle and lower class), type of housing (owned, rented, subleased and others) and number of people with whom the patient lives were organized as sociodemographic variables; number of comorbidities as a continuous variable; and history of NCD as a dichotomous variable.

A simple random sampling was conducted using a list of the day care center participants who had the same possibility of taking part in the study. This fact reduced the risk of bias and ensured that the information obtained from the study could be replicated in populations with similar characteristics. The research included 215 people from a sample of 500 whose expected proportion of loneliness was 40 %, with a statistical power of 95 % and an error of 5 %. The inclusion criteria were being 60 years of age or older and attending a day care center. The exclusion criteria were the unwillingness to participate in the study.

After being invited to participate in the study and signing the informed consent form, telephone calls were made, the questionnaire with the abovementioned variables was administered and the information was recorded in an electronic database, thus guaranteeing data anonymization.

Statistical analysis

A descriptive analysis of the information was performed. For the continuous variables, means and standard deviations were reported in the case of normally distributed variables, or medians and interquartile ranges in the case of non-normally distributed variables. Concerning the categorical variables, frequency and/or percentage tables were created. For the bivariate analysis, Student's *t*-test (normal distribution, quantitative variables) and chi-square test (categorical variables) were used with a statistical significance of $p < 0.05$. To estimate the nonparametric distribution, the Mann-Whitney *U* and Kruskal-Wallis tests were employed. To determine the association between the categorical dependent variable (dichotomized loneliness variable) and statistically significant factors, a multivariate logistic regression model was built and adjusted by age.

The data was analyzed using the Stata Statistical Software: Release 16.1. The level of statistical significance was set at a p value < 0.05.

Ethical considerations

The research protocol was approved and authorized by the Research and Ethics Committee (REC) of the School of Nursing at Pontificia Universidad Javeriana and the SDIS Departamento Administrativo de Diseño Estratégico (DADE - Administrative Department of Strategic Design). Moreover, it was classified as minimal risk under the terms of the Colombian law. The interviews were conducted by the researchers to protect data confidentiality and patient privacy. The data was recorded in a database with restricted access using the participants' coding. The authors declared no conflicts of interest; therefore, the results respect the principle of veracity.

RESULTS

The research included 215 elderly people whose mean age was 70.5 years with a SD of 6.90 and 72 % of whom were females. In relation to the marital status, 38.60 % (*n* = 83) were single, followed by widowed with 21.40 % (*n* = 46). Fifty-six percent (*n* = 121) had primary education and 60.90 % (*n* = 131) belonged to the middle class (socioeconomic status 3). Regarding the number of comorbidities, a median of 1 (IQR 0-1) was found (Table 1).

Table 1. Sociodemographic characteristics of the population at day care centers

Sociodemographic characteristics (N = 215)	
Age, mean (SD)	70.50 (6.90)
Sex, female, *n* (%)	155 (72.10 %)
Marital status, *n* (%)	
Married	28 (13.00 %)
Single	83 (38.60 %)
Widowed	46 (21.40 %)
Divorced	33 (15.40 %)
Living common-law	25 (11.60 %)
Educational level, *n* (%)	
No education	14 (6.50 %)
Primary education	121 (56.50 %)
Secondary education	57 (26.60 %)
Technical education	14 (6.50 %)
Professional education	8 (3.70 %)
Socioeconomic status, *n* (%)	
Lower class	84 (39.10 %)
Middle class	131 (60.90 %)
Type of housing, *n* (%)	
Owned	54 (25.10 %)
Rented	132 (61.40 %)
Subleased	6 (2.80 %)
Others	23 (10.70 %)
Number of people with whom the patient lives, median (IQR)	2 (1-3)
Chronic disease	
History of chronic NCD, YES, *n* (%)	145 (67.40 %)
Number of comorbidities, median (IQR)	1 (0-1)

SD: standard deviation; IQR: interquartile range; NCD: non-communicable disease.

According to the ESTE scale and the measurement of family loneliness, marital loneliness, social loneliness and adaptation crisis, 67 % (*n* = 143) of the study subjects showed a low level of family loneliness, 79 % (*n* = 170) a high and medium level of marital loneliness, 51 % (*n* = 108) a high and medium level of social loneliness, and 43 % (*n* = 92) a high and medium level of adaptation crisis (existential loneliness) (Table 2). Similarly, a data analysis by dimensions revealed that, in all dimensions, women experience higher levels of loneliness than men (Figure 1).

Table 2. Description of ESTE scale dimensions by levels

	Family loneliness	Marital loneliness	Social loneliness	Adaptation crisis
High, *n* (%)	39 (18.20 %)	162 (75.00 %)	29 (13.60 %)	14 (6.50 %)
Medium, *n* (%)	32 (14.90 %)	8 (3.70 %)	79 (37.10 %)	78 (36.30 %)
Low, *n* (%)	143 (66.80 %)	46 (21.30 %)	105 (49.30 %)	123 (57.20 %)

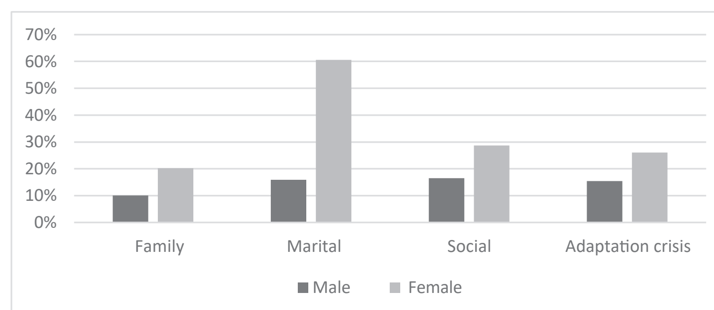

Figure 1. Dimensions of loneliness by sex

For the bivariate analysis, a level of statistical significance ($p < 0.05$) was considered in the different dimensions of family loneliness, marital loneliness, social loneliness and adaptation crisis as shown in Table 3, which presents statistically significant variables in each of the dimensions included in the logistic regression models.

Table 3. Bivariate analysis between the dimensions of loneliness and independent variables

	Family loneliness			Marital loneliness			Social loneliness			Adaptation crisis		
	Yes	No	*p* value	Yes	No	*p* value	Yes	No	*p* value	Yes	No	*p* value
Age, mean (SD)	69.1	71.20	0.03	70.60	70.10	0.67	69.70	71.30	0.09	69.60	71.10	0.11
	(6.60)	(6.90)		(7.10)	(6.30)		(6.20)	(7.40)		(6.25)	(7.30)	
Sex, female, *n* (%)	43	111	0.01	130	25	0.002	67	85	0.01	55	100	0.01
	(27.90 %)	(72.10 %)		(83.80 %)	(16.10 %)		(43.80 %)	(56.20 %)		(35.50 %)	(64.50 %)	
Marital status, *n* (%)												
Married	7	21	0.30	14	14	< 0.01	13	15	0.60	9	19	0.20
	(9.80 %)	(14.80 %)		(8.20 %)	(30.40 %)		(12.04 %)	(14.40 %)		(9.78 %)	(15.45 %)	
Single	33	49	0.09	80	3	< 0.01	52	29	0.01	40	43	0.20
	(46.40 %)	(34.50 %)		(47.30 %)	(6.50 %)		(48.1 %)	(27.80 %)		(43.50 %)	(34.90 %)	
Widowed	11	35	0.12	42	4	0.01	16	30	0.01	19	27	0.81
	(15.50 %)	(24.70 %)		(24.85 %)	(8.70 %)		(14.8 %)	(28.80 %)		(20.70 %)	(21.90 %)	
Divorced	15	18	0.10	31	2	0.02	15	18	0.73	15	77	0.73
	(21.13 %)	(12.70 %)		(18.30 %)	(4.35 %)		(16.3 %)	(14.60 %)		(45.40 %)	(42.30 %)	
Living common-law	5	19	0.16	2	23	< 0.01	13	11	0.73	9	16	0.46
	(7.0 %)	(13.40 %)		(1.18 %)	(50 %)		(12.04 %)	(10.50 %)		(9.78 %)	(13.01 %)	
Socioeconomic status, *n* (%)												
	31	52	0.32	65	19	0.73	53	30	0,01	47	37	0.01
Lower class	(43.66 %)	(36.62 %)		(38.46 %)	(41.30 %)		(49.07 %)	(28.85 %)		(51.09 %)	(30.08 %)	
Type of housing, *n* (%)												
Owned	13	41	0.09	41	13	0.58	27	27	0.872	23	31	0.97
	(18.31 %)	(28.87 %)		(24.26 %)	(28.26 %)		(25 %)	(25.95 %)		(25 %)	(25.20 %)	
Rented	49	82	0.11	103	29	0.80	67	62	0.72	55	77	0.67
	(69.01 %)	(57.75 %)		(60.93 %)	(63.04 %)		(62.04 %)	(59.62 %)		(69.78 %)	(62.60 %)	
Subleased	3	2	0.20	6	0	0.19	2	4	0.38	2	4	0.64
	(4.23 %)	(1.41 %)		(3.55 %)	(0.00 %)		(1.85 %)	(3.85 %)		(2.17 %)	(3.25 %)	
Others	6	17	0.43	19	4	0.62	12	11	0.90	12	11	0.34
	(8.45 %)	(11.97 %)		(11.94 %)	(8.70 %)		(11.11 %)	(10.58 %)		(13.04 %)	(12.94 %)	
Number of people with whom	1	2	< 0.01	1	2.50	0.00	1	2	0.12	1	2	0.01
the patient lives, median (IQR)	(0-2)	(1-4)		(0-3)	(1-3)		(0-3)	(1-4)		(0-2)	(1-4)	

	Family loneliness			Marital loneliness			Social loneliness			Adaptation crisis		
	Yes	No	*p* value	Yes	No	*p* value	Yes	No	*p* value	Yes	No	*p* value
Chronic disease												
History of chronic NCD, YES, *n* (%)	41 (57.75 %)	103 (42.74 %)	0.03	115 (68.05 %)	30 (65.22 %)	0.72	66 (61.11 %)	77 (74.04 %)	0.045	57 (61.96 %)	88 (71.54 %)	0.14
Number of comorbidities, median (IQR)	1 (0-1)	1 (0-2)	0.14	1 (0-2)	1 (0-1)	0.13	1 (0-1)	1 (0-2)	0.03	1 (0-1.50)	1 (0-1)	0.38

SD: standard deviation; IQR: interquartile range; NCD: non-communicable disease.

In relation to family loneliness, 28 % (*n* = 43) of the 155 participating women showed this type of loneliness with statistical significance ($p < 0.01$), 57.8 % (*n* = 41) had a history of chronic NCD ($p = 0.03$) and the number of people with whom the patient lives accounted for a median of 1 (IQR 0-1) ($p < 0.01$).

Concerning marital loneliness, 83.3 % (*n* = 130) of the participating women showed this type of loneliness with a statistical significance of $p = 0.01$. Regarding the marital status, statistical significance was found in all categories; however, they were not included in the regression model because of the collinearity effect. In relation to the number of people with whom the patient lives, $p = 0.01$ with a median of 1 (IQR 1-3) was found.

In the dimension of social loneliness, the statistically significant variables ($p < 0.05$) were female sex ($p = 0.01$), lower class ($p = 0.01$), history of chronic NCD ($p = 0.04$) and number of comorbidities ($p = 0.03$). Furthermore, in adaptation crisis, similar data was found in relation to sex and lower class.

In the logistic regression model, associations were found in the following variables according to each dimension: in marital loneliness, an adjusted *OR* = 3.15 (95 % CI: 1.55-6.39) related to female sex; in social loneliness, an adjusted *OR* = 1.95 (95 % CI: 1.08-3.52) related to lower class; and in adaptation crisis, an adjusted *OR* = 1.99 (95 % CI: 1.09-3.63) related to lower class (Table 4).

Table 4. Logistic regression models by dimension

Dimension	Variable	Adjusted *OR* (95 % CI)	*p* value
Marital loneliness	Sex, female	3.15 (1.55-6.39)	0.01
Social loneliness	Lower class	1.95 (1.08-3.52)	0.02
Adaptation crisis	Lower class	1.99 (1.09-3.63)	0.02

Source: self-elaboration.

DISCUSSION

The feeling of loneliness in the elderly population has an impact and a prevalence of 40 % and is related to the development of both physical and mental chronic NCDs [14]. Therefore, the timely detection of loneliness will allow health teams to develop strategies for disease prevention and health promotion.

Through the ESTE scale—which has already been validated in the Colombian population—the study found that the most frequent dimension of loneliness was related to marital loneliness, followed by social loneliness, adaptation crisis and, finally, family loneliness. In addition, it was associated with female sex and lower class. In accordance with the research carried out by Garza-Sánchez et al. [26], similar data was found for the dimension of marital loneliness in Spanish women.

As for sex, the results of this study agree with others': women show higher levels of loneliness [26]. Regarding the age, the results of the bivariate analysis were significant in the dimensions of family and social loneliness, which were similar to those found in other populations [27].

This research work also showed, in general terms, that the sample of older adults had a low educational level and, unlike previous studies, it was not associated with a higher level of loneliness in any of the dimensions [26-28]. Concerning the marital status, a statistically significant association was found in the dimension of marital loneliness, as expected [27].

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The low socioeconomic status showed a significant outcome in the dimensions of loneliness and adaptation crisis. Thus, it is important to examine and work on the adaptation crisis: a task that involves not only older adults but also the population that someday will become adults and should prepare themselves to reach this age from the approach of healthy aging [29].

As for the number of people with whom the patient lives, the results of the bivariate analysis were not significant in the dimension of social loneliness. However, it was significant in the other dimensions, so that living common-law and having a relationship were important variables [30].

Chronic NCDs were common in the study population and are generally frequent in older adults. It was significantly associated with the dimensions of family and social loneliness in the bivariate analysis but not significantly in the adjusted analysis. Furthermore, the number of comorbidities was low and showed a nonsignificant association in the regression model.

Regarding the limitations, as this was a cross-sectional study, only one measurement was taken. Therefore, the levels of loneliness and the associations resulting from the survey should be carefully examined and verified with another type of study, which will prevent a lower causality. Concerning the strengths, the ESTE scale, a validated tool in the Colombian population, was used to evaluate loneliness, and the expected sample size was reached. Since the population came from day care centers, a simple random sampling of all the people attending the center was performed to control the selection bias.

In conclusion, the feeling of loneliness is characteristic of women and single or widowed people. However, the results found in family loneliness should be highlighted, given that there is no evidence of high and/or medium levels.

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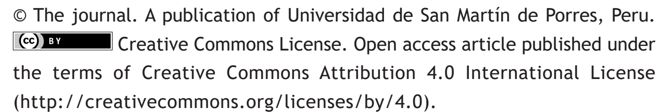
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