Identification of users according to degree of satisfaction with geriatric care services using cluster analysis

IDENTIFICAÇÃO DOS USUÁRIOS SEGUNDO NÍVEL DE SATISFAÇÃO NOS MÓDULOS GERONTOLÓGICOS EMPREGANDO A ANALISE DE CONGLOMERADOS

IDENTIFICACIÓN DE LOS PACIENTES SEGÚN NIVEL DE SATISFACCIÓN EN MÓDULOS GERONTOLÓGICOS EMPLEANDO EL ANÁLISIS DE CONGLOMERADOS

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ABSTRACT

The aim of this study was to identify groups of users according to their degree of satisfaction with geriatric care services and determine the primary factors associated with satisfaction. This was a cross-sectional study of 181 people enrolled in 36 modules pertaining to the State Workers Social Security Institute (ISSSTE) in Mexico. Degree of satisfaction was measured according to the following three areas: general characteristics of services offered, friendliness of staff and infrastructure. A cluster analysis was performed to identify groups of users according to their level of satisfaction, and an ordinal logistic regression model was used to determine the associated factors. Fifty-three percent were satisfied with the services, 34.3% were fairly satisfied and 12.7% were dissatisfied. The main characteristics associated with a greater degree of satisfaction were being female, older and the head of household. The health system must address this growing population and ensure the development of quality care to meet their needs.

RESUMO

Esta pesquisa teve como objetivos identificar os grupos de usuários segundo o grau de satisfação com a atenção recebida nos Módulos Gerontológicos e determinar os principais fatores associados. Trata-se de estudo transversal realizado com 181 usuários nos 36 módulos do Seguro Social dos Trabalhadores Públicos, no México. O nível de satisfação foi avaliado segundo três aspectos: características gerais da atenção recebida, amabilidade no trato e infraestrutura. Foi realizada uma análise de conglomerados para identificar grupos de usuários segundo o grau de satisfação e um modelo de regressão logística ordinal para identificar os fatores associados. Estiveram satisfeitos com o serviço 53% dos usuários; medianamente satisfeitos, 34,3%; e insatisfeitos, 12,7%. Os principais fatores associados com maior grau de satisfação foram: ser mulher, maior idade e ser chefe/a de família. O sistema de saúde deve dirigir sua atenção para esse grupo populacional que é crescente e incentivar o desenvolvimento de uma atenção de qualidade que contemple as suas necessidades.

RESUMEN

Se objetivó identificar grupos de usuarios según grado de satisfacción con la atención recibida en Módulos Gerontológicos, y determinar los principales factores asociados. Estudio transversal, muestra de 181 pacientes de los 36 módulos del Seguro Social de Trabajadores Estatales, en México. El nivel de satisfacción fue evaluado bajo tres aspectos: características generales de la atención recibida; amabilidad en el trato e infraestructura. Se realizó análisis de conglomerados para identificar grupos de pacientes según grado de satisfacción y un modelo de regresión logística ordinal para identificar factores asociados. Resultaron satisfechos con el servicio 53% de los pacientes; medianamente satisfechos 34,3% e insatisfechos 12,7%. Los principales factores asociados a mayor grado de satisfacción fueron: ser mujer, mayor edad, ser jefe/a de familia. El sistema de salud debe dirigir su atención a este grupo poblacional creciente, e incentivar el desarrollo de una atención calificada que contemple sus necesidades.

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INTRODUCTION

The older adult (OA) population has been increasing and will continue to represent a greater proportion of the overall worldwide population in the coming years. According to United Nations estimates, the global OA population will increase from 600 million to 2 billion within the next 50 years (from 2000 to 2050). This phenomenon will also occur in the Latin American and Caribbean region, where the OA population is expected to increase from 42 million to 100 million between 2000 and 2025 due to ongoing and substantial changes in the age structure of the population. This process of rapid population aging presents challenges for a number of countries, including Mexico, where the OA population has grown steadily over the past 25 years. Estimates for 2010 indicate a population of individuals 60 years or older of over 10 million, representing 8.9% of the total population. This phenomenon puts pressure on pension and social security systems and increases the demand for health care[1] and the need for skilled labor in geriatric services. Similarly, it will lead to an increased demand for long-term care[2]. Published studies widely recognize that the concept of quality is composed of at least two identifiable and analyzable dimensions: the technical and the interpersonal. The former comprises the technical, clinical and administrative processes involved in service production, while the latter refers to the relationship between service providers and users, with a focus on ensuring fundamental rights, fair treatment, access to information and satisfaction with these services. Providing adequate health services for older adults promotes *active aging*,[3] which is defined as the process of optimizing opportunities for health, active participation and security, which together, increase quality of life as one ages. Social security institutions in Mexico have expressed concern as progressively broader segments of their beneficiary populations have reached 60 or 65 years of age. Of all the public institutions providing health services in the country, the Mexican Institute for Social Security Services for Federal Government Employees (ISSSTE, Spanish acronym) has the oldest beneficiary population, which is why it launched its Geriatric Modules (GM) initiative in 1997 to offer individual and population-based health services to this population. GM are physical spaces located within ISSSTE primary health care units that are specifically equipped to provide outpatient care to people aged 60 or older who have been referred with a diagnosis of a chronic illness. Geriatric Modules are staffed by professional and technical personnel who have received basic training in geriatric health care. The main objective is to provide continuous care to users, including maintaining biological indicators within reasonable ranges, prescribing and filling medications, providing information on managing home-based illnesses and organizing self-help groups to improve illness management through social interaction. Identifying and taking into consideration users' perspectives[4-5] is one potential strategy for both improving health care delivery and building a strong health care system that actively connects all parties involved. For that reason, and due to the implications of a growing OA population, the objective of this study was to identify groups of users, using cluster analysis, according to their degree of satisfaction with the services received in geriatric care modules and to determine the factors associated with satisfaction.

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METHOD

Study design and population

The analytical sample consists of older adults participating in the *Older Adults' Satisfaction with Mexico City Geriatric Modules and Associated Factors* study, which was a cross-sectional study conducted in April 2010. The 181 participants were recruited based on a non-probabilistic sample selection of OA users of 36 ISSSTE Geriatric Modules located in Mexico City. The study employed a structured questionnaire that had been previously assessed for comprehension during a pilot phase conducted with seven OA users in one GM.

Staff trained by the National Institute of Public Health conducted face-to-face interviews with OA participants in the waiting room of each GM. After obtaining informed consent, the OAs who agreed to participate were interviewed until the quota of five interviews per GM was reached. Interviewers collected information on socio-demographic, socio-economic and health-related characteristics. Respondents were also asked about GM service conditions and general aspects of the care they received.

Measurement of variables and statistical analysis

The dependent variable, the older adults' degree of satisfaction with care received in the GM, was operationalized as follows:

An indicator was constructed of perceived satisfaction of care using eight variables for the following three areas: 1) module characteristics (cleanliness, signage, accessibility and timeliness of appointments); 2) friendliness of staff (doctors, nurses, and administrators); and 3) infrastructure. A range of one to 10 points was calculated for each of these variables (items), with a higher value indicating greater satisfaction. A new variable, expressed as the simple sum total of all eight items, was then constructed to measure overall user satisfaction, with higher scores indicating greater satisfaction. Based

on the assumption that the study population could be divided into groups according to their degree of satisfaction with the care they received, we used cluster analysis (with the eight items rating satisfaction) to identify potential groups of individuals in terms of perceived quality. Specifically, we used the *k-means* partitioning method and a dendrogram to select the optimal number of groups[6].

Because the groups defined by cluster analysis could be ordered on a scale of dissatisfied to satisfied, we used an ordinal logistic regression analysis model to identify factors that were associated with satisfaction of the care received. Additionally, because the perception of users of the same GM could be correlated, the statistical analyses used robust variance estimators to account for a lack of independence among observations[7]. Given the importance of the relationship between the level of satisfaction and the independent variables, we used the Kruskal-Wallis test for continuous variables and chi-square tests for categorical variables. All statistical analyses were performed using the STATA statistical package.

The National Institute of Public Health's Ethics (CI: 513, No. 239) Biosecurity and Research Committees approved the original project, and informed consent was obtained.

RESULTS

Based on the score obtained from the sum of the eight variables composing our satisfaction measure, the cluster analysis identified three potential groups of older adults with regard to perceived satisfaction with care as follows: 53% of individuals were classified as satisfied, 34.3% were classified as fairly satisfied and 12.7% were classified as dissatisfied.

Table 1 presents the main socio-demographic characteristics of the participants as well as measures of perceived health status. The sample shows a predominance of women and people aged 70 or older, as well as an overall low number of professionals. There are also higher proportions of users who have received care at the GM for over one year, who report having received all or most of the medications and who perceive their health status as good or regular. Participants experienced greater difficulty with mobility compared to other types of limitations, and 12.2% of the sample reported living alone.

Table 1 - Sociodemographic characteristics of GM users - Mexico City, 2010

Variable	N	%
Sex		
Female	125	69.1%
Male	56	30.9%
Age		
Mean	73,25	
Standard deviation	8,01	
Education level completed		
Professional degree	14	7.7%
High school	36	19.9%
Junior high school	28	15.5%
Elementary school	90	49.7%
No formal education	13	7.2%
Living arrangement		
With another person	159	87.8%
Alone	22	12.2%
Head household		
OA is the head of household	93	51.4%
OA is not the head of household	88	48.6%
Caregiver		
OA has a caregiver	114	63%
OA does not have a caregiver	67	37%
Medications received		
All/most	139	76.8%
Some/few/none	42	23.2%
Length of time using Module		
<1 year	50	27.6%
1 to 5 years	92	50.8%
5 years or more	39	21.6%
Perceived health status		
Very good	10	5.5%
Good	73	40.3%
Regular	75	41.4%
Poor	21	11.6%
Very poor	2	1.1%
Reported difficulty with		
No physical difficulties	80	44.2%
Mobility	69	38.1%
Hearing	20	11.1%
Hands/arms	6	3.3%
Vision	5	2.8%
Don´t Know	1	0.5%

Table 2 presents the results of the comparative analysis of OA characteristics according to level of satisfaction with care. Females ($p < 0.001$), older individuals ($p < 0.006$) and those who had received care at the GM for a longer period of time ($p < 0.035$) tended to express greater satisfaction, while people who considered themselves to be in poor or very poor health tended to be less satisfied ($p < 0.000$)

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Table 2 - Sample characteristics by level of satisfaction - Mexico City, 2010

Covariates		Satisfied	Fairly satisfied	Dissatisfied	p-value*
		n = 96	n = 62	n = 23	
Female	%	74.0%	74.2%	34.8%	0.001
Age (in years)	Mean	74.48 (0.84)	73.02 (0.98)	68.78 (1.25)	0.006
OA is the head of household	%	56.3%	45.2%	47.8%	0.370
OA does not have a caregiver	%	43.8%	37.1%	8.7%	0.008
OA self-reported health status very poor/ poor/ regular	%	40.6%	64.5%	82.6%	<0.000
Length of time using Module (in days)	Mean	1071.68 (82.88)	797.47 (91.93)	672.52 (113.07)	0.035

* p-value for the Chi-square test or Kruskal-Wallis test.
( ): Standard deviation.

Factors associated with perceived satisfaction are shown in Table 3. As the descriptive statistics above indicate, being older and being female were significantly associated with higher levels of satisfaction. Variables related to living arrangements that increased the likelihood of satisfaction were as follows: being the head of household, not having a caregiver and having received geriatric care in the GM for a longer period of time. In contrast, a poor perception of general health status decreased the likelihood that a participant was satisfied with the care received.

Table 3 - Factors associated with older adults' satisfaction - Mexico City, 2010

Variable	OR	Standard error*	$CI_{95\%}$	
Female	2.8631	1.1890	1.2686	6.4615
Age (in years)	1.0751	0.0245	1.0281	1.1242
OA is the head of household	2.4757	0.8789	1.2346	4.9647
OA does not have a caregiver	2.5135	0.8948	1.2510	5.0502
OA self-reported health status very poor/ poor/ regular	0.2476	0.0976	0.1143	0.5363
Length of time using the Module (in days)	1.0007	0.0002	1.0002	1.0011
Intercept 1	4.2871	1.9500		
Intercept 2	6.5989	1.8217		

* Robust standard errors, taking into account the degree of correlation of older adults within a geriatric module.

DISCUSSION

In contrast to a study that found sex to not be associated with satisfaction, individuals participating in the present study who were satisfied or fairly satisfied were predominantly female[8]. Nevertheless, several characteristics associated with greater satisfaction are consistent with the results of previous studies, including older age[9-12], heads of household without a caregiver, long-time users of the GM and people who consider themselves to have good or very good health[8,10,12]. In addition, women with a greater degree of autonomy[13] may benefit most from this focused care. It follows that the profile of the satisfied group contrasts with that of the dissatisfied group, with the dissatisfied group tending to be male, younger, heads of household with a caregiver, considering themselves to have poor or very poor health and being short-term users of the GM services; these results agree with those from another study[10].

Unlike studies that have relied on analysis of pre-existing data[8,10,13], this study permitted exploration of issues that have not previously been reported by others. This is largely due to the method used to obtain information, which came directly from primary health care users in the place where care was received. While other studies have collected information about services[14-17], they have not specifically addressed older adults as a population group, and most have been based on surveys with distinct characteristics. The variables composing our satisfaction score address a variety of aspects of care provision that have been employed by several studies in different countries. These include interpersonal treatment[16], accessibility[15], infrastructure[16] and care processes. From an economic perspective, the increase in costs associated with population aging is not necessarily due to older age itself but rather to the increased number of chronic illnesses that accompany aging[1,13]. Therefore, the development of policies that promote quality of life at older ages[17-18] will provide longer-lasting and more effective results.

This study has limitations inherent to cross-sectional analyses. First, it is difficult to identify whether the care provided by the modules has improved over time. Additionally, because study participants were part of a convenience sample rather than a representative sample, satisfied people could have been over-represented. Furthermore, interviews were conducted while participants were still in the module, which may have influenced their responses; nevertheless, to avoid measurement bias, the interviewers were external to the ISSSTE and were trained on this issue. Another limitation inherent to this type of survey is its high dependence on the social characteristics and expectations of the users[19]. Despite the limitations mentioned above, the study explores phenomena that have not been thoroughly studied to date. An increase in demand by aged populations as a consequence of an increase in chronic illnesses will require a response from

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health care institutions in developing countries. This response involves primary care actions, and it is becoming an increasingly urgent issue.

CONCLUSION

This study presented a potentially useful tool to measure satisfaction and an innovative analysis technique.

This is especially important considering that research studies insist on the use of this type of measurement to improve management performance. Overall, users' perceptions of satisfaction of care is extremely important to quality, as better delivery of care leads to better attendance and treatment adherence. These conditions make it possible to progress towards improving quality of life in the later stages of life

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