



INSTITUTO NACIONAL DE
CIENCIAS MÉDICAS
Y NUTRICIÓN
SALVADOR ZUBIRÁN

"2015, Año del Generalísimo José María Morelos y Pavón"

ACUSE

México, D.F. a 26 de febrero de 2015

DR. JOSÉ ALBERTO ÁVILA FUNES
INVESTIGADOR PRINCIPAL
DEPTO. DE GERIATRIA
INSTITUTO NACIONAL DE CIENCIAS MÉDICAS Y NUTRICIÓN "SALVADOR ZUBIRÁN"
AV. VASCO DE QUIROGA NO. 15
COL. BELISARIO DOMÍNGUEZ SECCIÓN XVI
DEL TLALPAN, MÉXICO, D.F.
C.P. 014080
PRESENTE

Habiendo analizado detalladamente el protocolo de investigación clínica, titulado:

"Factores sociodemográficos, de índole geriátrica, de salud y de movilidad asociados con la deficiencia de transporte de los adultos mayores que acuden a la consulta externa del Instituto Nacional de Ciencias Médicas y Nutrición Salvador Zubirán"


El Comité de Investigación **aprobó** su solicitud.

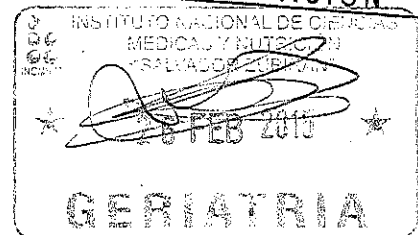
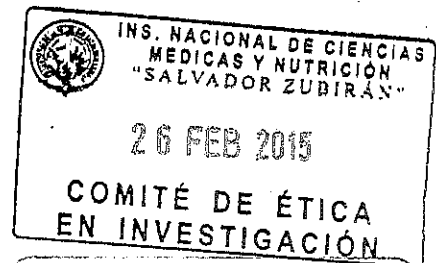
Se le recomienda considerar en el análisis estadístico el tipo de transporte requerido (basado en las características de los pacientes) y cuantificar en una forma más precisa el estado socioeconómico de los participantes

Su proyecto quedo registrado en esta Institución con la **REF. 1496**. Este número es necesario para los servicios de apoyo a la investigación.

Sin más por el momento quedo de Usted:

ATENTAMENTE


DR. CARLOS A. AGUILAR SALINAS
PRESIDENTE
COMITÉ DE INVESTIGACIÓN



c.c.p. Dr. Gerardo Gamba Ayala, Director de Investigación.

Vasco de Quiroga No. 15
Colonia Sección XVI
Delegación Tlalpan
México, D. F. 14000
Tel. (52) 54870900
www.incmnsz.mx



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El Comité de Ética en Investigación **aprobó** su solicitud, solo se hacen las siguientes sugerencias:

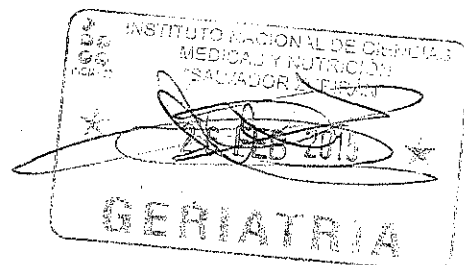
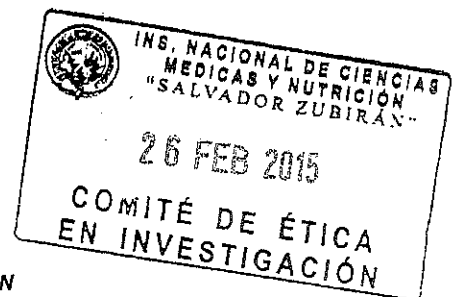
- 1.- El contacto en el CI debe ser el investigador principal, pág 3 y 4.
- 2.- Evaluar si es suficiente con la Pregunta 18 para la evaluación de los problemas de transporte.

Su proyecto quedo registrado en esta Institución con la **REF. 1496**. Este número es necesario para los servicios de apoyo a la investigación.

Sin más por el momento quedo de Usted.

ATENTAMENTE


DR. ARTURO GALINDO FRAGA
PRESIDENTE
COMITÉ DE ÉTICA EN INVESTIGACIÓN



Vasco de Quiroga No. 15, Dr. Gerardo Gamba Ayala, Director de Investigación.
Colonia Sección XVI
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Tel. (52) 54870900
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INSTITUTO NACIONAL DE
CIENCIAS MÉDICAS
Y NUTRICIÓN
SALVADOR ZUBIRÁN

ACUSE

México, D.F. a 17 de septiembre de 2015

DR. JOSÉ ALBERTO ÁVILA FUNES
INVESTIGADOR PRINCIPAL
DEPTO. DE GERIATRÍA
INSTITUTO NACIONAL DE CIENCIAS MÉDICAS Y NUTRICIÓN "SALVADOR ZUBIRÁN"
AV. VASCO DE QUIROGA No. 15
COL. BELISARIO DOMÍNGUEZ SECCIÓN XVI
DEL TLALPAN, C.P. 14080, MÉXICO, D.F.
PRESENTE


Le informamos que con relación al Protocolo de Investigación Clínica, titulado:


"FACTORES SOCIODEMOGRÁFICOS, DE ÍNDOLE GERIÁTRICA, DE SALUD Y DE MOVILIDAD ASOCIADOS CON LA DEFICIENCIA DE TRANSPORTE DE LOS ADULTOS MAYORES QUE ACUDEN A LA CONSULTA EXTERNA DEL INCMNSZ"
REF. 1496

Estos Comités toman conocimiento del cierre de estudio, con fecha 02-Septiembre-2015.

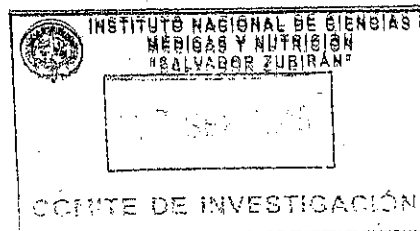
Sin otro particular, reciba un cordial saludo.

ATENTAMENTE,


DR. CARLOS A. AGUILAR SALINAS
PRESIDENTE
COMITÉ DE INVESTIGACIÓN


DR. ARTURO GALINDO FRAGA
PRESIDENTE
COMITÉ DE ÉTICA EN INVESTIGACIÓN

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Delegación Tlalpan
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Instituto Nacional de Ciencias
Médicas y Nutrición
Salvador Zubirán

INSTITUTO NACIONAL DE
CIENCIAS MÉDICAS Y
NUTRICIÓN

SALVADOR ZUBIRAN

Dirección de Investigación

FORMA ÚNICA PARA REGISTRO
DE PROYECTOS

FECHA DE RECEPCIÓN: 10/02/2015

CLAVE: GER-1496-15/1

TÍTULO: Factores sociodemográficos, de índole geriátrica, de salud y de movilidad asociados con la deficiencia de transporte de los adultos mayores que acuden a la consulta externa del Instituto Nacional de Ciencias Médicas y Nutrición Salvador Zubirán

INVESTIGADOR RESPONSABLE: AVILA FUNES JOSE ALBERTO

DEPARTAMENTO O SERVICIO: SERVICIO DE GERIATRÍA

TIPO DE INVESTIGACIÓN: INVESTIGACIÓN EPIDEMIOLÓGICA

PATROCINADORES:

Patrocinador	Cantidad

VIGENCIA DEL PROYECTO: Del 02/03/2015 al 01/06/2015

Trimestre 1

Trimestre 2

Trimestre 3

Trimestre 4

COSTO TOTALES DE LA INVESTIGACIÓN		INSTITUCIONES PARTICIPANTES	
Personal	\$ 0.00		
(sueldos y sobresueldos al personal)			
Equipos	\$ 0.00	FIRMAS	
(de laboratorio, cómputo, transporte, etc.)			
Materiales	\$ 0.00	Investigador responsable	Jefe de Departamento
(reactivos, consumibles, desechables, etc.)			
Animales	\$ 0.00	Comité de Investigación en Humanos	Comité de Investigación en Animales
(adquisición, cuidado, procedimientos, etc.)		Director de Investigación	Director General
Estudios	\$ 0.00	Fecha de resolución	
(de laboratorio, gabinete, especiales, etc.)			
Viaticos	\$ 0.00		
(reuniones científicas y trabajo de campo)			
Publicaciones	\$ 0.00		
costo directos de publicación, sobregiro)			
Suscripciones	\$ 0.00		
(libros, revistas, software, periódicos, etc)			

Varios	\$ 0.00
(teléfono, fax, fotocopias, mensajería, etc)	
Admon. Gastos pacientes	\$ 0.00
Fondo de apoyo	\$ 0.00
15% de la cantidad total del proyecto	
Total :	\$ 0.00



UNIVERSIDAD NACIONAL AUTÓNOMA DE MÉXICO

ESPECIALIZACIÓN EN GERIATRÍA

DIVISIÓN DE ESTUDIOS DE POSGRADO

FACULTAD DE MEDICINA

INSTITUTO NACIONAL DE CIENCIAS MÉDICAS Y NUTRICIÓN

SALVADOR ZUBIRÁN

“Factores Sociodemográficos, de Índole Geriátrica, de Salud, y de Movilidad Asociados con la Deficiencia de Transporte de los Adultos Mayores que acuden a la Consulta Externa del Instituto Nacional de Ciencias Médicas y Nutrición Salvador Zubirán”

TESIS DE POSGRADO

PARA OBTENER EL GRADO DE ESPECIALISTA EN GERIATRÍA

P R E S E N T A

Dr. Carlos Tonatiuh Medina Rimoldi

Tutor de tesis:

Dr. Alberto Ávila Funes

Jefe del servicio de Geriatria

Dra. Ana Patricia Navarrete Reyes

Médico adscrito al servicio de Geriatria

Instituto Nacional de Ciencias Médicas y Nutrición Salvador Zubirán

México D.F.

julio 2015



HOSPITAL CIVIL DE GUADALAJARA
ANTIGUO HOSPITAL CIVIL DE GUADALAJARA "FRAY ANTONIO ALCALDE"
SERVICIO DE GERIATRÍA

Otorgan la presente

CONSTANCIA

a:

A: Carlos Tonatiuh Medina Rimoldi, 2, Ana Patricia Navarrete Reyes, José Alberto Ávila Funes.

Por su participación como: PRESENTADOR

DE CARTEL EN EL CONCURSO DE TRABAJOS LIBRES, OBTENIENDO EL 1er. LUGAR, EN LA CATEGORIA DE INVESTIGACIÓN, FACTORES SOCIODEMOGRÁFICOS, DE INDOLE GERIÁTRICA, DE SALUD Y DE MOVILIDAD ASOCIADOS CON LA DEFICIENCIA DE TRANSPORTE DE LOS ADULTOS MAYORES QUE ACUDEN A LA CONSULTA EXTERNA DEL INSTITUTO NACIONAL DE CIENCIAS MÉDICAS Y NUTRICIÓN 'SALVADOR ZUBIRÁN'

dentro del

XX Simposium Internacional de Geriatria y Gerontología
"Fray Antonio Alcalde"

"La Salud del Pueblo es la Suprema Ley"
Guadalajara, Jalisco, México
Agosto 06, 07 y 08 del 2015

Dr. Héctor Raúl Pérez Gómez
 Director General
 Hospital Civil de Guadalajara

Dr. Benjamín Guerrero Rodríguez
 Director
 Antiguo Hospital Civil de Guadalajara
 "Fray Antonio Alcalde"

Dr. David Leal Mora
 Jefe del Servicio de Geriatria
 Antiguo Hospital Civil de Guadalajara
 "Fray Antonio Alcalde"

Dr. Julio Alberto Díaz Riancho
 Presidente
 XX Simposium Internacional de Geriatria y Gerontología
 "Fray Antonio Alcalde"



COLEGIO NACIONAL
DE MEDICINA
GERIÁTRICA

El Colegio Nacional de Medicina Geriátrica
otorga la siguiente

CONSTANCIA

DR. CARLOS TONATIUH MEDINA RIMOLDI

Por la Presentación del Trabajo de Investigación en la modalidad:

POSTER

Con el Tema :

FACTORES SOCIODEMGRÁFICOS, DE INDOLLE GERIATRICA, DE SALUD Y DE MOVILIDAD ASOCIADOS CON LA DEFICIENCIA DE TRANSPORTE DE LOS ADULTOS
MAYORES QUE ACUDEN A LA CONSULTA EXTERNA DEL INSTITUTO NACIONAL DE CIANCIAS MEDICAS Y NUTRICION "SALVADOR ZUBIRAN" (INCMNSZ)

CO-AUTORES

DR. JOSE ALBERTO AVILA FUNES, DRA. ANA PATRICIA NAVARRETE REYES

durante el

4º Congreso Anual del Colegio Nacional de Medicina Geriátrica

Del 20 al 22 de agosto de 2015 - Ciudad de México

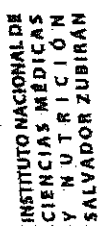
Dra. Ivonne Karina Becerra Laparra
Presidente

Dr. Jorge Luis Torres Gutiérrez
Vicepresidente

Dr. Rodolfo Emmanuel Albrecht Junghanns
Secretario Propietario



Asociación de Médicos
Instituto Nacional de Ciencias Médicas
y Nutrición, Salvador Zubirán

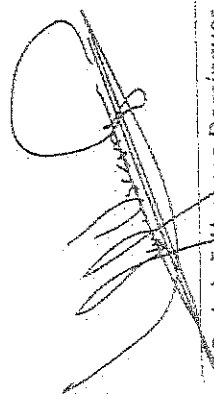


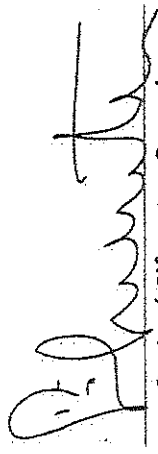
La Asociación de Médicos del Instituto Nacional de Ciencias Médicas y Nutrición "Salvador Zubirán", otorga la siguiente

CONSTANCIA

a: **DR. CARLOS TONATIUH MEDINA RIMOLDI**

Por la presentación oral del trabajo de investigación:
"Factores sociodemográficos, de índole geriátrica, de salud y de movilidad asociados con la deficiencia de transporte de los adultos mayores que acuden a la consulta externa del INCMNSZ"
durante la LVII Reunión Anual de la Asociación de Médicos del Instituto Nacional de Ciencias Médicas y Nutrición "Salvador Zubirán"
Del 7 al 10 de Octubre de 2015 | Veracruz, Veracruz


Dr. Luis F. Uscaña Domínguez
Presidente


Dr. José Sifuentes Osornio
Secretario



Asociación de Médicos
Instituto Nacional de Ciencias Médicas
y Nutrición, Salvador Zubirán



INSTITUTO NACIONAL DE
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Y NUTRICIÓN
SALVADOR ZUBIRÁN

La Asociación de Médicos del Instituto Nacional de Ciencias Médicas y Nutrición "Salvador Zubirán", otorga la siguiente

CONSTANCIA

a: **DR. CARLOS TONATIUH MEDINA RIMOLDI**

Coautores: Dra. Ana Patricia Navarrete Reyes, Dr. José Alberto Ávila Funes.

- Servicio de Geriatría del INCMNSZ -

Por haber obtenido el **SEGUNDO LUGAR**

en la presentación oral del trabajo de investigación:

"Factores sociodemográficos, de índole geriátrica, de salud y de movilidad asociados con la deficiencia de transporte de los adultos mayores que acuden a la consulta externa del INCMNSZ"

durante la LVII Reunión Anual de la Asociación de Médicos del Instituto Nacional de Ciencias Médicas y Nutrición "Salvador Zubirán"

Del 7 al 10 de Octubre de 2015 | Veracruz, Veracruz

Dr. Luis F. Uscanga Domínguez
Presidente

Dr. José Sifuentes Osornio
Secretario

ORIGINAL ARTICLE: EPIDEMIOLOGY,
CLINICAL PRACTICE AND HEALTH**Correlates of subjective transportation deficiency among older adults attending outpatient clinics in a tertiary care hospital in Mexico City**Ana Patricia Navarrete-Reyes,¹ Carlos Tonatiuh Medina-Rimoldi¹ and José Alberto Avila-Funes^{1,2†}¹Department of Geriatrics, National Institute of Medical Science and Nutrition "Salvador Zubirán", Mexico City, Mexico and ²Research Center INSERM, Bordeaux, France

Aim: Older adults frequently report problems of transportation. Little is known about the correlates of transportation deficiency in Latin America. Therefore, the aim of the present study was to determine the correlates of subjective transportation deficiency (STD) among community-dwelling older adults attending a tertiary care hospital in Mexico City.

Methods: Cross-sectional study of 228 participants aged ≥ 70 years being followed in any of the outpatient clinics of a tertiary care hospital in Mexico City. Data were obtained through a structured questionnaire. Univariate and multivariate logistic regression analyses were carried out in order to identify the correlates of STD.

Results: The mean age of the participants was 79.8 years (SD 6.4) and 67.1% were women. STD was present in 46% of participants. The multivariate logistic regression model showed that female sex, illiteracy, mobility disability and the use of an assistive walking device had an independent and statistically significant association with STD.

Conclusions: Female sex, illiteracy, mobility disability and the use of an assistive walking device were independent correlates of STD in the present study. Identifying the frequency and correlates of transportation deficiency in vulnerable populations will allow for the identification and implementation of useful public policies, as well as for the optimization of prevention and treatment strategies in an attempt to preserve mobility and autonomy, especially in low- and middle-income countries where previous work on transportation deficiency is lacking. *Geriatr Gerontol Int* 2017; ●●: ●●-●●.

Keywords: disability, Latin America, mobility, older adults, transportation.

Introduction

In 2002, the World Health Organization released a policy framework on active aging attempting to optimize opportunities for health, participation and security in order to enhance quality of life as people grow older. When describing the various determinants of active aging, several characteristics of the physical and social environments, such as accessible and affordable public transportation, were included.¹ However, some settings can pose significant challenges transportation wise.

Mexico is an upper middle-income country struggling to accommodate the needs of a growing number of elderly citizens. Its capital city has experienced significant suburban dispersion in recent decades, and is considered

one of the largest urban areas in the world.² Nowadays, older community-dwellers in Mexico City are mostly female (55.9%), and only 42.4% have completed an elementary school education. A large proportion of them reports disability for activities of daily living (26.1%), whereas just a small proportion (37%) receives income from a retirement payment or fund,³ which places them at high risk for transportation restraints.^{4,5} Densely populated (9700 inhabitants/km²), the Mexico City metropolitan area has an ample offer of public structured transportation that includes 12 subway lines, nine city bus lines (metro bus), one suburban train line, eight trolley bus lines and 47 intermodal connection centers. However, Mexico City's structured transportation net relies on the existence of informal transit that is dominated by concession models (minivans and minibuses), which are frequently not adapted to the needs of older adults: high-floor vehicles difficult to get in and out of, overcrowded services, untrained and reckless drivers, unsignaled stops without waiting seats, unscheduled stops, and so on. This informal transit provides a feeder

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Correspondence: José Alberto Avila-Funes MD, PhD, Department of Geriatrics, Instituto Nacional de Ciencias Médicas y Nutrición Salvador Zubirán, Vasco de Quiroga 15, CP 14080, Tlalpan, Distrito Federal, México. Email: avilafunes@live.com.mx

complaint affecting the participant's functionality were also investigated.

Transportation characteristics

Explored transportation characteristics included: access to the public transit (structured or informal) within a 10-min walk (yes vs no) and types of transportation used at least once during the previous week: walking, taking a taxi ride, riding a car as a passenger, driving and using other types of public transportation (which included subway, bus, suburban train, trolley bus, minivans and minibuses). Results regarding the use of different transportation options do not add up to a 100%, since frequently using more than one type of transportation was reported.

Statistical analysis

The variables are described using frequencies and proportions or means and standard deviations where appropriate. For the comparison between participants with and without STD, the χ^2 -test or Student's *t*-test were used according to the variable type. In order to develop an explanatory model of STD, unadjusted logistic regression models were created to identify the sociodemographic and health correlates of STD. Finally, a forward multiple logistic regression model was used to find the best-fit model. The cut-off level for independent variables in the full model was set at $\alpha = 0.10$, but the variables significantly associated with STD at the 0.05 level were retained. Interaction terms between, sex*mobility disability and sex*socioeconomic level were tested in the final model. However, no interaction terms were statistically significant and therefore they are not shown. For all statistical tests,

95% confidence intervals (CI) were given, and the Nagelkerke R^2 was also reported. The analyses were carried out using SPSS statistical package (version 20; SPSS, Chicago, IL, USA).

Results

The mean age was 79.8 years (SD 6.4), and 67.1% of participants were women. Hypertension and osteoarthritis were the most frequent chronic diseases (57.5% and 45.6%, respectively); 7.9% of participants were not able to read or write, while most of them (96.1%) lived in a suburban or urban community. Visual and hearing impairments were present in 87.3% and 54.4% of participants, respectively. Mobility disability as per the Rosow-Breslau scale was reported by 77.2%, and 46.7% used an assistive walking device. Table 1 shows the sociodemographic and health status of participants according to the presence or absence of STD. STD was present in 46% of participants. Participants with STD were more likely to be older ($P = 0.002$), women ($P = 0.001$), illiterate ($P = 0.001$), to report mobility disability ($P < 0.001$), to use an assistive walking device ($P < 0.001$) and to report memory problems interfering with their functionality ($P = 0.038$), but less likely to have a partner ($P = 0.003$) or to have any type of cancer ($P = 0.042$) when compared with those not reporting STD.

Table 2 shows types of transportation used during the previous week according to the presence of STD. Participants with STD were less likely to have access to any type of transportation (structured or informal) within a 10-min walk ($P = 0.011$) when compared with those without it, they were also less likely to have driven during the

Table 1 Sociodemographic characteristics according to the absence or presence of subjective transportation deficiency

	All ($n = 228$)	Without STD ($n = 123$; 54%)	With STD ($n = 105$; 46%)	<i>P</i> -value
Mean age, years (SD)	79.8 (6.5)	78.5 (6.1)	81.2 (6.6)	0.002
Female, <i>n</i> (%)	153 (67.1)	71 (57.7)	82 (78.1)	0.001
With a partner, <i>n</i> (%)	100 (44.2)	65 (53.3)	35 (33.7)	0.003
Illiteracy, <i>n</i> (%)	18 (7.9)	3 (2.4)	15 (14.3)	0.001
Non-rural population, <i>n</i> (%)	219 (96.1)	120 (97.6)	99 (94.3)	0.308
Very low socioeconomic level, <i>n</i> (%)	77 (33.8)	37 (30.1)	40 (38.1)	0.202
Hypertension, <i>n</i> (%)	131 (57.5)	73 (59.3)	58 (55.2)	0.531
Diabetes, <i>n</i> (%)	82 (36.0)	43 (35.0)	39 (37.1)	0.732
Any neoplasm, <i>n</i> (%)	41 (18.0)	28 (22.8)	13 (12.4)	0.042
Osteoarthritis, <i>n</i> (%)	104 (45.6)	49 (39.8)	55 (52.4)	0.058
Peripheral neuropathy, <i>n</i> (%)	87 (38.2)	40 (32.5)	47 (44.8)	0.058
Visual impairment, <i>n</i> (%)	199 (87.3)	112 (91.1)	87 (82.9)	0.064
Hearing impairment, <i>n</i> (%)	124 (54.4)	64 (52.0)	60 (57.1)	0.440
Mobility disability, <i>n</i> (%)	176 (77.2)	79 (64.2)	97 (92.4)	<0.001
Use of an assistive walking device, <i>n</i> (%)	106 (46.7)	37 (30.1)	69 (66.3)	<0.001
Memory complaint affecting functionality, <i>n</i> (%)	59 (25.9)	25 (20.3)	34 (32.4)	0.038

STD, subjective transportation deficiency.

operational issues, such as the patient's safety. However, according to the Organization for Economic Co-operation and Development in Europe (high-income countries), approximately half of older people's trips are made by private car, whereas trips walking show a U-shaped curve, with middle-aged people walking less than younger and older people.²⁵ Older adults are also less likely to drive a car than to walk or use public transportation when compared with other adult age groups.²⁶ In contrast, findings from lower-middle income countries, such as Nigeria, show that 58.4% of older adults lack personal means of transportation, and that walking accounts for 36.9% of travel modes used by this population.²⁷ Most likely, the present results represent an intermediate state between high-income and lower-middle countries. Nevertheless, further investigation is required on this matter.

Transportation constraints in elderly populations translate into reduced access to goods and services,²⁸ injuries and health problems,^{29,30} social isolation,²³ and diminished civic participation. Most likely, the aforementioned associations are also present in senior populations living in Latin American countries. With a prevalence of STD as high as that encountered in the present study, it is clear that efforts to accommodate varying levels of disability and thus making transportation options accessible to older adults are required in Mexico City; however, in order to do so, the pros and cons of the actual transportation options ought to be known. Unfortunately, little information is available regarding transportation characteristics and its implications on the lives of older adults living in Latin American cities.²⁰ Regarding Mexico City, only gray literature exists.^{7,19} In an unpublished survey of 100 older adults using a city bus line, Macías-Martínez reported that participants had to take a walk lasting an average of 12.9 min (SD 7.5) in order to get to the bus station. If they were aged >80 years, they were more likely to report the presence of obstacles in their path, as well as the need to use the available handrails. The authors also report on other obstacles including the absence of waiting seats, inadequately placed visual signs or illegible signs, absent or obstructed access ramps, and busses starting before the passengers are seated as well as breaking too hard for them to hold on adequately to their seats.¹⁹ In high-income countries, such as the USA and the UK, attempts have been made to make public transportation more user-friendly for older adults. Valley Metro System in Phoenix, Arizona, replaced 80% of its fleet with low-floor vehicles to ease access for older adults. Other states have developed "on-call" services for older adults, allowing older adults to make trips on fixed-hours by calling bus drivers directly. In general, policies such as improving amenities at transportation facilities, expanding existing services, and developing new or/and specialized transportation options are taking place around the world with some success.³¹

In the case of disabled older adults whose capabilities no longer meet those required to use public transit, such as those likely to be followed up in a tertiary care medical center, creation of incentives to the use of private resources for non-profit transportation could represent a suitable alternative. However, this is still uncharted territory in Mexico. In addition, policies abroad have also been created to prioritize public expenditures for roads and highways designed according to practices proven to assist senior drivers and pedestrians.³²

Several limitations must be acknowledged. The cross-sectional design of the present study precludes us from establishing the directionality of the associations. Additionally, no objective measures of transportation or health are available, as the assessment was carried out through a structured questionnaire. Furthermore, only a limited amount of information regarding transportation choices was gathered, and the existence of selection bias is expected because of the characteristics of the studied population and the study site. Nevertheless, due to the scarcity of available information on transportation among older adults living in Latin American countries, and because of the known health-related correlates of transportation restrains in elderly populations, the present study sets a precedent and underscores the need for public policies promoting user-friendly transportation for older adults, as well as for medical and physiotherapeutic interventions designed to enhance the individual's capacities.

In conclusion, identifying the frequency and correlates of transportation deficiency in vulnerable populations will allow to identify gaps of opportunity to implement public policies, as well as prevention and treatment strategies in an attempt to preserve mobility, autonomy, and subsequently to reduce transportation deficiency in elderly populations.

Disclosure statement

The authors declare no conflict of interest.

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