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Research Paper

Trajectories of limitations in activities of daily living among older adults in Mexico, 2001−2012

Carlos Díaz-Venegas, Ph.D.[a,*], and Rebeca Wong, Ph.D.[b,c,d]

[a]Max Planck Institute for Demographic Research, Konrad-Zuse-Str. 1, 18057 Rostock, Germany
[b]Sealy Center on Aging, The University of Texas Medical Branch, USA
[c]Preventive Medicine & Community Health, The University of Texas Medical Branch, USA
[d]WHO/PAHO Collaborating Center on Aging and Health, The University of Texas Medical Branch, USA

Abstract

Background: Trajectories of disability are an essential component to understand the burden of disability at the societal level. Longitudinal studies, compared to cross-national studies, enable a better analysis of the progression of physical limitations among the elderly. However, information on disability dynamics in developing countries is limited.

Objectives: This paper examines the changes in activities of daily living (ADLs) in an 11-yr. period in the Mexican elderly population aged 60 or older and identifies how sociodemographic variables alter these trajectories.

Methods: The data come from the Mexican Health and Aging Study (MHAS), a national sample of adults born in 1951 or earlier, including a baseline survey in 2001 and follow-ups in 2003 and 2012.

Results: The ADL score increased on average by 0.03 for every year respondents aged after 60. In contrast, the ADL score was reduced by 0.06 for every additional year of education.

Conclusions: Age, gender, and years of education were confirmed to influence the trajectories of ADL limitations. Understanding the patterns of deterioration of functional limitations will help public health policies to better serve the population. © 2016 Elsevier Inc. All rights reserved.

Keywords: Activities of daily living (ADLs); Trajectories; Mixed-effects model; Older adults; MHAS; Mexico

Basic Activities of Daily Living (ADLs) refer to functional capabilities that are essential to survival and independence and tend to deteriorate with old age.[1] Declines in functionality in old age present a challenge not only because they reduce the quality of life of the individual but also because they add additional social, time, and financial burdens to the family and community around the elder. From the individual standpoint, and taking into consideration that full or partial recovery is possible, a person with functional limitations tends to lose independence, social networks, and mental capacity over time.[2,3] Additionally, the decline in functionality increases the probability of being institutionalized or dying as a result of these limitations.[4] From the community perspective, families are affected emotionally and economically as they have to spend more time and money to provide proper care for their loved ones.

Trajectories of disability are an essential component to understand the burden of disability at the societal level[5] and longitudinal studies, compared to cross-national studies, enable a better analysis of the progression of functionality among the elderly. Most longitudinal studies of disability come from developed countries. Romoren and Blekeseaune[6] analyzed trajectories of ADL limitations in Norwegians aged 80 or older and found that respondents took (on average) 1.7 years to move from having no ADL limitations to having one ADL limitation. Other studies focus on specific segments of the population in the United States like older institutionalized adults in Michigan,[2] veteran military men,[7] or older migrants.[8] Studies have used different definitions of physical limitations such as combining ADLs with Instrumental Activities of Daily Living (IADLs), and/or mobility items to analyze trajectories of disability by gender[9]; by race/ethnicity[10−12]; or

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* Corresponding author. Tel.: +49 (0)381 2081 166.
E-mail address: cadiazve@utmb.edu (C. Díaz-Venegas).

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by respondents with a specific illness like diabetes[13] or stroke.[14]

Despite the different targeted populations and the contrasting methodologies used in all these studies, the majority tend to agree that: 1) age seems to play an important role in establishing viable trajectories of disabilities; 2) women tend to be more disabled than men; and 3) lower levels of education increase the prevalence of ADL limitations. However, in most cases, it is hard to adapt these findings to the context of a developing nation because the speed of the progression and the prevalence of disability vary across age cohorts and even within populations. Thus trajectories of functional limitations might be unique to a specific population.[15,16]

Unfortunately, information on disability dynamics in developing countries is limited.[17] Recent studies have measured the prevalence of obesity and disability in older adults aged 65 or older living in six Latin American cities[18]; calculated the trajectories of disability and mortality among the oldest-old in China[19] and examined the trajectories of disability and their association with onset, recovery, and mortality in Taiwan,[20] opening the door for further research.

A recent study compared ADLs in similar respondents in Mexico and in the United States. In Mexico, 10.6% of respondents aged 51 or older in 2001 had at least one ADL while 11.5% of U.S. respondents aged 52 or older in 2000 had at least one ADL. However, almost twice the share of older adults in Mexico (5%) had higher prevalence of three or more ADLs compared to older adults in the US (2.6%).[21] Further, the authors find that recovery from one ADL limitation at time-1 to no limitations at time-2 is prevalent in both countries but more likely in Mexico (53.0% in the US compared to 62.7% in Mexico). And those with zero or one ADL limitation at time-1 in the U.S. had higher probability of dying than similar respondents in Mexico. Another study analyzed the effect of educational attainment on the transitions of disability in urban Mexico (2001–2003) and the city of São Paulo, Brazil (2000 and 2006). Results indicated that men in urban areas in Mexico had a higher incidence of disability than men in São Paulo and both genders in Mexico showed significantly higher recovery rates from disability across all ages.[22] Recovery in urban areas in Mexico might be linked to age, gender, and years of education.

One study examined the effect of physical activity on the transitions of disability in Mexico (2001–2003) and in the United States (2000–2002). Results showed that, among older adults with no ADL limitations, exercise is much more common in the US than in Mexico (44% vs. 27%) and its protective effect on disability is stronger in the U.S.[23] Finally, a study analyzed how Body-Mass Index (BMI) affects the transition of disability in older adults in Mexico (2001–2003) and in the United States (2000–2002). The study found a stronger association in the U.S. between obesity (BMI of 30 or higher) and disability. In fact, obesity appeared to be more prevalent in the U.S. than in Mexico (23.4% vs. 20.5%) and a higher percentage of obese respondents in the U.S. (16.6%) reported at least one ADL limitation compared to reports by obese respondents in Mexico (9.6%).[24]

As reliable longitudinal survey data on aging from developing countries have become available, it is now possible to start analyzing the trajectories of ADL limitations among older adults in Mexico. The purpose of this paper is to provide an overview of the progression of limitations in ADLs in the Mexican elderly population over time. We use cohorts born prior to 1940, because, during their life span, these cohorts saw considerable achievements in population health like the reduction of the fertility rate and the increase in life expectancy[25] along with fast urbanization and industrialization for certain segments of the population.[26] Our hypothesis is that the number and progression of ADL limitations faced by the elderly population in Mexico will vary by socioeconomic conditions like age, gender, and education. This is because socioeconomic inequalities during the life cycle will change the risk of an older adult becoming physically limited.

Data and methods

Sample

Data come from the Mexican Health and Aging Study (MHAS), a nationally representative study of health and aging in Mexicans born in 1951 or earlier. Participants were first interviewed in 2001 in a stratified sample representative of the national population (response rate of 92%) with follow-ups in 2003 (response rate of 93%) and 2012 (response rate of 88%). The database provides detailed health characteristics such as limitations with ADLs and IADLs, cognition, depression, and mobility.[27–29] For more information about the study please refer to Wong, Michaels-Obregón, and Palloni.[30] This study was approved by the Institutional Review Boards or Ethics Committees of the University of Texas Medical Branch in the United States, the *Instituto Nacional de Estadística y Geografía* (INEGI) and the *Instituto Nacional de Salud Pública* (INSP) in Mexico.

Our sample is based on 6519 respondents aged 60 or older and with a direct interview at baseline. We excluded 366 respondents who were lost to follow-up after the first wave and 231 respondents who required a proxy in at least two waves because information of just one period will not be significant in a longitudinal analysis. Additionally, we excluded 170 respondents who did not provide complete ADL information at baseline. The final sample included 5752 respondents. The excluded respondents were older, predominantly not married (divorced, separated, widowed, or never married) and had, on average, almost two fewer years of schooling than respondents who were included in

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