
GERONTOLOGY

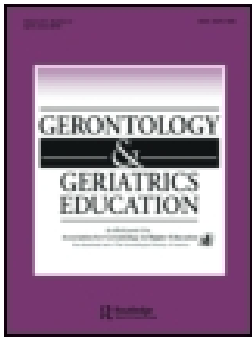
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Maricruz Rivera-Hernandez PhD, Sergio Flores Cerqueda MS & José Carlos García Ramírez PhD

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The growth of gerontology and geriatrics in Mexico: Past, present, and future

Maricruz Rivera-Hernandez, PhD^a, Sergio Flores Cerqueda, MS^b,
and José Carlos García Ramírez, PhD^b

^aCenter for Gerontology and Health Care Research at Brown University School of Public Health, Providence, Rhode Island, USA; ^bUniversidad Estatal del Valle de Toluca, Ocoyoacac, Estado de México, Mexico

ABSTRACT

Life expectancy is increasing in Mexico, creating new opportunities and challenges in different areas, including gerontology and geriatric education and research. Although in the European Union there are more than 3,000 institutions that focus on aging research, in Latin America there are only 250 programs where theoretical and practical knowledge is taught. In Mexico, the number of institutions that offer gerontology and geriatric education is relatively small. One of the major concerns is that Mexico is not adequately prepared to optimally deal with the aging of its population. Thus, the main challenge that Mexico faces is to train practitioners, researchers, and policy makers to be able to respond to the aging priorities of this country. The goal of this review is to investigate the literature regarding 60 years in the fields of gerontology and geriatrics in Mexico. Even when programs have evolved within the past decades, there are some challenges to gerontological and geriatric education and aging research in Mexico. The implications for Mexico are discussed, as well as opportunities for moving these fields forward.

KEYWORDS

Geriatrics in Mexico;
gerontology in Mexico;
growth of geriatrics in
Mexico; growth of
gerontology in Mexico

Introduction

During the 1950s the first geriatric-gerontology meetings were held in Mexico. However, it was not until the late 1980s when the first formal geriatric training was offered and early 2000s when the country's first undergraduate program in gerontology officially started. The first article that discussed the growth of gerontology was written in 1959 by Dr. Manuel Payno, and then Dr. Armando Pichardo published a book chapter about the development of gerontology in Mexico in 2009 (Payno, 1959; Pichardo, 2009). Publications in gerontology and geriatrics have reflected a traditional medicalized view of aging, and as such these two pieces heavily focused on the development and growth of geriatrics education and research in Mexico (García Ramírez, 2015). Therefore, this article analyzes the historical development, current needs, and available training in geriatrics and gerontology and how these programs have informed current policy and programs for older adults.

Aging of the Mexican population, challenges, and opportunities

During the 20th century the Mexican population experienced important sociodemographic changes. Like many other countries, Mexico saw a dramatic decrease in mortality accompanied

CONTACT Maricruz Rivera-Hernandez, PhD ✉ Maricruz_Rivera-Hernandez@Brown.edu 📧 Department of Health Services, Policy and Practice, Brown University, Box G-5121-6, Providence, RI 02912-G, USA.

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by an increase in life expectancy. In 1970, infant mortality was 77 deaths per 1,000 live births, which was reduced to 31 deaths per 1,000 live births by 2015 (Instituto Nacional de Estadística y Geografía [INEGI], 2014). Accordingly, life expectancy increased from 61 years in 1970 to 75 years by 2014 (INEGI, 2014c). This transition has produced changes in the population structure. Based on the most recent Census estimates, there are about 10.1 million older adults age 60 and older, which represents 9% of the total population (INEGI, 2014b). It is projected that the population of older adults will continue to grow, creating different challenges for different institutions in Mexico. These challenges can be observed at the micro- and macrolevel, affecting older adults and the government. Mexico has seen an increase in the prevalence of chronic conditions, including obesity, diabetes, hypertension, heart disease, and chronic obstructive pulmonary disease (Pan American Sanitary Bureau, 2015). Although these conditions require health care utilization and self-management, many older adults have low access to health services (Juárez-Ramírez et al., 2014). At the same time there is a lack of resources and medical personnel to provide appropriate care for older adults with chronic conditions (Marmolejo Guarneros, 2013; Tapia Hernandez, 2012). In addition, family members are facing increased burden of care due to disability and frailty of their aging partners/parents (Rodríguez-Medina & Landeros-Pérez, 2014). Mexico is undergoing this transition, creating an extensive demand for health and social services and professionals in gerontology and geriatrics, therefore showing that the Mexican society needs to be better prepared to serve the needs of the aging population (Instituto Nacional de las Personas Adultas Mayores [INAPAM], 2010).

Gerontology and geriatrics in Mexico, the beginning

Gerontology, along with geriatrics research and education in Mexico, has lagged behind other countries. One of the first attempts to understand the needs of Mexican older adults was started by Dr. Manuel Payno, a pioneer in the field of geriatrics in Mexico (Congreso Panamericano de Gerontología, 1956). Due to Dr. Payno's efforts, the first Panamerican Congress of Gerontology was held in Mexico City in 1956 (Pichardo, 2009). Fifty-five scientists from all over the world attended this meeting, sharing their expertise in the medical field (Payno, 1980). Dr. Payno had an article published in the *Journal of Gerontology* in 1959 titled "The Growth of Gerontology," where he described these meetings and the progress made in the geriatrics field (Payno, 1959). Of note, most sessions (90%) covered topics related to geriatric medicine, whereas little attention was focused on social support and networks, caregiving, role of family members, and hospital infrastructure (García Ramírez, 2015).

Despite the initial interest and enthusiasm to conduct more work on geriatric topics, there were no other meetings in Mexico for two decades. Although other countries in Latin America were moving gerontology and geriatrics forward, Mexico did not make any progress during this period. In the early 1970s, the Mexican government met with physicians and social scientists to promote scholarly research in gerontology and geriatrics. As a result of this meeting, the *Sociedad de Geriatria y Gerontología de México* (Mexican Geriatrics and Gerontology Society; GEMAC) was created in 1977, and it has greatly contributed to research and education related to aging. GEMAC became part of the *International Association of Gerontology* (IAG; now the International Association of Gerontology and Geriatrics [IAGG]), and Mexico held the IAG's 14th World Congress

in 1989 (GEMAC, 2016; Mora, Miguel, & Carlos, 2006). Some of the first workshops, certificates and lectures in gerontology and geriatrics were conducted by GEMAC. Yet there was not a clear distinction between gerontology and geriatrics.

The next two decades showed remarkable progress for gerontology and geriatrics. The early 1980s saw the formation of the Mexican Council of Geriatrics (*Consejo Mexicano de Geriatria*, created in 1983) and the Mexican Association of Gerontology and Geriatrics (*Asociacion Mexicana de Gerontologia y Geriatria*, created in 1984) (*Asociacion Mexicana de Gerontologia y Geriatria*, 2016; Consejo Mexicano de Geriatria, 2016; Mora et al., 2006). *Consejo Mexicano de Geriatria*, approved by the National Academy of Medicine in Mexico, certifies medical professionals in the geriatric field. Just like GEMAC, *Asociacion Mexicana de Gerontologia y Geriatria* was created to bring together researchers and practitioners from biological and social sciences, and to promote research, collaboration, and dissemination of knowledge regarding older adults. Differences between these two organizations are not clear. There are currently many other organizations that provide continuing education, evidence-based geriatric training, and discussion about public policy. Yet it was only recently that a multidisciplinary group of experts in the field of aging and health joined forces to create the National Institute of Geriatrics (*Instituto Nacional de Geriatria*; INGER) (Gutiérrez-Robledo, Ávila-Fematt, & Montaña-Álvarez, 2010; Instituto Nacional de Geriatria, 2015). The process began in 2007, when the “ad hoc group” of experts from the Mexican National Institutes of Health, the Mexican Institute of Social Security, the National Institute of Older People, the Faculty of Medicine of the National Autonomous University of Mexico, and the National System for Integral Family Development created a feasibility report for the creation of INGER (Gutiérrez-Robledo et al., 2010). On July 28, 2008, then-Mexican president Felipe Calderon Hinojosa signed a decree on the creation of INGER, which was later published by the *Official Gazette of the Federation* (*Diario Oficial de la Federacion*, 2008). These organizations began to raise awareness of rising life expectancies and increased aging of the Mexican population. They have not only aided in the advancement of geriatric and gerontological knowledge, application and dissemination, but also started the training of specialized human resources in the aging field, thereby influencing academic institutions, health organizations and government agencies.

Geriatric education and current demands in Mexico

Caring for older adults poses multiple challenges (Kovner, Mezey, & Harrington, 2002). First, falls and other geriatric conditions may lead to acute and long-term complications (Tinetti, Gordon, Sogolow, Lapin, & Bradley, 2006). Older adults may need complex care because they often have to manage two or more chronic conditions, including diabetes and hypertension, which requires treatment from multiple providers (Coleman, 2003). Finally, older adults may rely on caregivers due to disability and cognitive impairment (Schumacher, Beck, & Marren, 2006). The increased number of older adults and prevalence of chronic conditions requires changes in the current health care system and health care professionals trained to provide effective treatment.

The Mexican health care system is fragmented. Multiple providers serve public- and private-sector employees, and the rest of the Mexican population. The Mexican Social Security Institute (*Instituto Mexicano del Seguro Social*; IMSS) provides coverage for

private sector employees. Institute of Social Services and Security for State Workers (*Instituto de Seguridad y Servicios Sociales de los Trabajadores del Estado*; ISSSTE) serves government employees. Private practices are used by those without health insurance who can afford out-of-pocket services and those who have private health insurance policies. Finally, popular health insurance (*Seguro Popular*; SP) provides coverage for the poor and uninsured that cannot afford out-of-pocket costs or are unemployed (Robledo, Ortega, & Lopera, 2012). According to the Mexican Census, 13% of IMSS, 18% of ISSSTE, and 9% of SP beneficiaries were age 60 years and older (Instituto Nacional de Estadística y Geografía [INEGI], 2014a). These institutions offer outpatient and inpatient services for their beneficiaries. Mexico does not have long-term care infrastructure at the federal level. Some states in conjunction with for-profit and non-for-profit organizations offer some day care and institutionalized care for the elderly (Robledo et al., 2012).

In this country, geriatric training began in 1986 was offered informally by the ISSSTE regional hospital, *Lic. Adolfo López Mateos* in Mexico City, and formally by the Autonomous University of Nuevo Leon (Mora et al., 2006). In addition, out of the 57 medical schools only three offered geriatric courses; there were 10 geriatricians who were trained in other countries and 17 geriatricians trained by ISSSTE with no university affiliation (Gutiérrez & Kershenobich, 2012). A few years later, the Geriatrics Department of the National Institute of Health Sciences and Nutrition “Salvador Zubirán” began offering geriatric courses in 1989; and in 1993, the first generation of physicians at Salvador Zubirán completed their geriatric medicine specialty (Mora et al., 2006). Today, geriatric courses are a standard part of the medical school curriculum in Mexico. However, the majority of the instructors are not geriatricians or gerontologists (Gutiérrez & Kershenobich, 2012; Mora et al., 2006). Despite these different associations and institutions that offer courses in geriatrics and the number of universities that are including geriatric curriculum in their medical training, there are not enough geriatricians to satisfy the increasing demand in Mexico (Tapia Hernandez, 2012). *Consejo Mexicano de Geriatria* has certified about 400 geriatricians in Mexico (Consejo Mexicano de Geriatria, 2016). Comparing this number to the United States, the American Geriatric Society reported one physician certified in geriatrics per every 2,500 older Americans; according to the Institute of Medicine, this means that there are not enough specialists to care for older adults (Fineberg, 2008; Stone, 2011). In Mexico, based on the more than 400 geriatricians, there is one geriatrician for every 22,000 older adults (Tecnológico de Monterrey, 2015). Thus, Mexico’s workforce is 10 times smaller than that of the United States.

Current challenges of geriatric education and research in Mexico

Mexico’s health care workforce receives little geriatric training. Although venues to train geriatric professionals have expanded over the past 20 years, opportunities for advanced geriatric training are limited. As of 2010, there were seven universities with geriatric programs: (1) *Universidad Nacional Autónoma de México*, (2) *Instituto Politécnico Nacional*, (3) *Universidad Autónoma de Nuevo León*, (4) *Universidad de Guadalajara*, (5) *Universidad Autónoma del Estado de México*, (6) *Instituto de Estudios Supiores de Monterrey*, and (7) *Universidad de Monterrey* (Gutiérrez & Kershenobich, 2012). Most of these programs are located in bigger metropolitan areas requiring students to relocate, which may create some financial burden. Although some of these programs have trained

professionals since 1986, recruitment and retention of medical professionals are still a major problem.

Geriatric medicine does not attract medical professionals to meet the needs of the aging population in Mexico. One of the major challenges is to awaken the interest for professionals to specialize in geriatrics (Tapia Hernandez, 2012). First, recruiting is difficult because geriatric medicine is a subspecialty of internal medicine that requires 6 years of training (four in internal medicine and two for specialty). Internists choose to subspecialize in cardiology, gastroenterology, or urology before moving into geriatrics. Geriatric specialists earn less income than these other specialties. Second, there are negative stereotypes of working with older adults. In Mexico, many physicians do not want to get trained to care for people who are elderly. Some providers believe that older adults just want to talk and waste their time during appointments (Tapia Hernandez, 2012), which is rooted in agism. Unfortunately, this is a common sentiment. In a study done by Franco, Villarreal, Vargas, Martínez, and Galicia (2010) at an IMSS hospital in Queretaro, Mexico, results showed a high prevalence of negative stereotypes among all health care personnel, including physicians, nurses, and social workers. This is relevant because IMSS provides care to all workers employed in the formal private sector and their families in Mexico (Robledo et al., 2012). Third, there are restricted opportunities for job placement. In Mexico, there are fewer than 30 health care centers specialized in geriatric services, most of them located in Mexico City, Monterrey, and Guadalajara, which are part of larger hospitals (Robledo et al., 2012). Despite having 6.7 million beneficiaries age 60 and older, IMSS did not have a formal care model to care for geriatric patients until 2010 (Aragón, 2012). Similarly, some hospitals in the ISSSTE system have up to 60% of patients who are age 60 years and older (El Siglo de Torreon, 2005). ISSSTE has only two hospitals, *Hospital Regional de León*, *Guanajuato* and *Hospital Regional Lic. Adolfo López Mateos in Mexico City*, that provide geriatric services for public-sector employees (Gutiérrez & Kershenovich, 2012).

Mexico does not have the infrastructure to care for older adults. In terms of geriatric services, there is still a gap between the needs of older Mexicans and the health care system to satisfy them. According to Mora et al. (2006) there are only about 100 beds that are dedicated to the elderly in Mexico. Out of the 10.5 million older adults age 60 and older, 16% are covered primarily by IMSS and ISSSTE, and the rest are Seguro Popular's target population. Seguro Popular does not have a geriatric model, but there is potential for it. This is needed because more than 85% of older beneficiaries have adherence problems due to transportation issues, drug coverage and other treatment-related expenses (García Ramírez, 2015). The medical model is just starting to change from an acute curative model to care for infectious disease to long-lasting management of chronic conditions.

Another area that needs improvement is palliative care. Currently, there are only six schools out of the 102 medical schools that offer palliative care training in Mexico, and only 250 physicians with some training in palliative care (Villa Cornejo, 2015). Mexico's health law grants people with terminal illness the right to palliative care (Human Rights Watch, 2014). In 2009, right to palliative care was approved in Mexico City (Centro de Cuidados Paliativos, 2016). There are four hospitals that the Ministry of Health have dedicated to provide palliative care to beneficiaries (Excelsior, 2015). Palliative care group has more than 120 health professionals including physicians, nurses, therapists, social

workers, dentists and other administrative personnel. It provides support for patients and family members regarding the care of the person with terminal illness. In addition, the Center for Palliative Care provides palliative care for people in their homes. Unfortunately, at the moment these services are only serving Mexico City and surrounding areas. The other 17 states in Mexico have one care unit and IMSS and ISSSTE have few facilities that offer this service. People often have to travel long distances to receive this care, and those who do not have the resources die at home without it (Human Rights Watch, 2014). To improve this gap, the Mexican government offers palliative care through Seguro Popular in their packet of benefits. In addition, the Mexican Official Norm 011-SSA3-2014 requires public and private health services to have a unit or to provide palliative care for those who need it (Villa Cornejo, 2015). This is just the beginning for this type of care; to provide palliative care there is need for more infrastructure, workforce, pharmacologic treatment, and financing. This will require coordination and organization of the health care system in Mexico.

In terms of geriatric research, lack of funding and infrastructure are two major issues that this field faces (De La Fuente, Martuscelli, & Alarcón-Segovia, 2004). Without training programs and career awards, it is difficult to increase the number of researchers in geriatrics. The United States has development awards and training programs available to fellows to attract and develop early-career investigators to conduct geriatric research, which are scarce or unavailable in Mexico (Bartels et al., 2010). Access to scientific knowledge may also be limited to trainees. For example, the cost of access to scientific journals is prohibited for most institutions in Mexico, and thus researchers may rely on open access journals. Research journals in Mexico have low impact factors and low visibility, which may limit their recognition (Paniagua Roldán, 2005). Researchers may feel unappreciated in the scientific and lay communities without resources for promoting and disseminating scientific knowledge and may be forced to pursue more lucrative and successful careers. Other challenges to geriatric research include lack of time to devote to research, methodological skills to conduct clinical research, and mentors who could guide geriatricians in Mexico. Research training requires close mentorship and support to reward research and protect clinical demands, which are limited in Mexico.

Mexican health care and educational institutions moving geriatrics forward

Many public and private institutions are trying to include geriatric training for their workforce. IMSS, ISSSTE, the Ministry of Health at the federal and state levels, Fundación Médica Sur, Centro Médico ABC, and Hospital Español provide geriatrics courses to their personnel since the past decade. These courses are certified by different universities, including University of Guadalajara and Guanajuato, Autonomous University from San Luis Potosí and the National Polytechnic Institute, and the Monterrey Institute of Technology and Higher Education. This has important implications for the development of better health care workforce not only to meet the needs, but to improve the quality of care of older adults in Mexico (Gutiérrez & Kershenovich, 2012).

Some institutions are undertaking major efforts to strengthen their care models for older adults. IMSS geriatric care program (GERIATRIMSS) has four different objectives, including promotion of healthy aging, implementation and strength of geriatric care, education and training in geriatrics, and gerontology and geriatric research (Instituto

Mexicano del Seguro Social, 2016). IMSS is currently specializing about 50 physicians who will be graduating this year (Al Momento Noticias, 2014). The IMSS geriatric program is affiliated with UNAM and IPN. GERIATRIMSS provides preventive and curative treatment for older adults. The outpatient geriatric unit (*Sala de Día Geriátrica*) has more than 100 patients. In one appointment, the patient is seen by a geriatrician, psychologist, physical therapist, dietician, nurse, and social worker (Ultra Noticias, 2013). This model may improve care coordination, team-based care, and quality of care in the institution. In the coming years, other organizations may need to implement this and/or other geriatric models of care to meet the challenges of the aging population in Mexico.

INGER has greatly contributed to the body of knowledge on aging and health. INGER has about 20 researchers conducting studies clinical epidemiology, demographic epidemiology and social determinants of health, and biomedical engineering and gerotechnology, and basic science. Besides some collaborative work with national universities, INGER is working with Université de Sherbrooke, University of Texas Medical Branch, and University of Southern California. It receives funding from the World Health Organization, National Institute on Aging, United Nations, and the Pan-American Health Organization. INGER has published different lines of research through its free open-access journals and articles published in gerontology and geriatric journals such as *Journal of Cross Cultural Gerontology*, *Research on Aging*, and *Journal of American Geriatrics Society*.

Gerontology education in Mexico

Undergraduate programs

The growth of gerontology as a discipline in Mexico mirrors the development of geriatric programs. Gerontology is a young scientific field of study in Mexico, but it is quickly evolving and flourishing as a field (Secretariat of Public Education [SEP], 2016). The existence of gerontology and geriatric organizations promoting education in gerontology has been invaluable to the progress of gerontology as a discipline in Mexico. However, for a long time there was not a clear distinction between geriatrics and gerontology, there was a lack of emphasis in understanding the aging process from a biopsychosocial and spiritual perspective, and there was limited involvement of micro- and macrolevel perspectives of aging (Montes de Oca Zavala & Klein Caballero, 2013).

Early efforts of undergraduate training in gerontology began a little over a decade ago in 2004. For the first time, two universities offered programs for students who wanted to specialize in the field of aging: *Universidad Mesoamericana de San Agustín* (UMSA), Mérida, Yucatán and *Universidad Estatal del Valle de Ecatepec* (UNEVE), Ecatepec, State of Mexico. The curriculum was developed to prepare and expose students to the diverse context of the biopsychosocial aspects of the aging process. These programs provide students with training to work on a variety of settings including welfare programs, health centers, case managers, and research institutions. Similarly, gerontology programs in the *Universidad Autónoma del Estado de Campeche*, State of Campeche and *Universidad Autónoma del Estado de México* (UAEM), Toluca, State of Mexico, started in 2005 and 2007, respectively. The curriculum of these two programs focuses more on health and health promotion of older adults, as well as promoting self-care and self-efficacy in older adults (Rivera-Hernandez, 2011).

After 2007, at least one university developed bachelor programs in gerontology every year. These include *Universidad Autónoma del Estado de Hidalgo* (UAEH) State of Hidalgo, and the *Universidad Estatal del Valle de Toluca* (UNEVT), Ocoyoacac, State of Mexico, *Centro Mexicano de Ciencias y Humanidades* (CMUCH), Puebla, Puebla, *Universidad para la Profesion Estrategica* (UNIPRE) Toluca, State of Mexico, and *Universidad de Guadalajara*, Toanala, Jalisco in 2008, 2009, 2010, 2011, and 2012, respectively. These programs include training in biopsychosocial aspects of aging and teaching gerontological principles that allows their graduates to work in a variety of settings. Other universities such as *Instituto Mexicano de Psicooncología* are working toward offering the gerontology bachelors in different campuses. The evolution of these programs is evident. Yet the vast majority of these undergraduate programs are offered in private institutions located in Mexico City and surrounding areas, excluding the northern part of Mexico. Although they include an interdisciplinary approach toward the study of aging, schools concentrate their curricula around preparing students to promote healthy aging and elder care. This may be due to the fact that the vast majority of job offers for gerontologists are related to health services, specifically home health (Rivera-Hernandez, 2011).

Graduate programs

There has been some growth of graduate programs in gerontology in Mexico since 2006. Different universities offer graduate certificate programs in gerontology, and Master programs in gerontology (SEP, 2016). This is another accomplishment toward gerontology becoming a distinct discipline in Mexico.

Currently, there are three universities that offer master programs in Social Gerontology including *Universidad Juárez Autónoma de Tabasco*, *Universidad Mesoamericana de San Agustín*, and *Centro Mexicano de Ciencias y Humanidades*, and one masters in gerontology from the *Universidad de Guadalajara*. These masters programs are designed to train professionals in gerontology from a multi- and interdisciplinary perspective to contribute to effective care, demands and needs of older adults, promote quality of life of the aging population families, and to generate lines of intervention, teaching, and research in this age group. Coursework includes core areas of aging research, teaching (andragogy and geragogy), and an array of applied courses in health and aging, elder law, economics of aging, program evaluation, and policy research. However, each program presents unique opportunities in the array, richness and variety of courses and delivery options for students (Rivera-Hernandez, 2011).

The *Universidad Juárez Autónoma de Tabasco* program requires students to complete 132 credits (40 of these are for thesis) and 640-hour internship. More than one half of their skill courses are related to health and health care of older adults, including palliative care and thanatology, geriatrics, sexuality, oral health, and nutrition. Perhaps due to the majority of the faculty members being health care professionals. *Universidad Mesoamericana de San Agustín* master program is completed in four semesters. Students take four courses per semester, which are taught during the weekends, and it requires completion of a thesis to graduate. Its coursework includes aging and family dynamics, physical and mental health, aging in the community, leisure time, aging and quality of life, and normal and pathological aging.

Students in the master's program at *Centro Mexicano de Ciencias y Humanidades* complete their degree in 2 years. As opposed to the other programs, this is delivered by modules. There are 16 modules, taught on four Saturdays for 8 hours each. Students may complete a thesis, textbook, or educational multimedia projects. This program is more focused on managerial training with the inclusion of different courses of economics of aging, elder law, design and evaluation of geronto-geriatric programs, administration of geronto-geriatric services, and policy and programs for older Mexicans.

Students in the gerontology program at *Universidad de Guadalajara* need to complete 82 credits to graduate, and 20 of them are internship work. Coursework includes applied and theory classes. Students are taught statistics and research methods, biology of aging, sociology of aging, psychology of aging, and active and healthy aging. Areas of concentration include epidemiology of aging, administration of gerontological services, clinical gerontology, and psychogerontology. For their internships, students are placed in the community in different social organizations, and in health centers, hospitals, day care, and other institutions that provide institutionalized care for older adults. Coursework is divided into 17 required courses, two selective courses, and two optional courses. Completion of a thesis is also a requirement (Rivera-Hernandez, 2011).

These programs are preparing professionals in gerontology and a cadre of leaders to potentially serve as gerontology faculty in academic settings. Enrollment among these programs appears to be growing. However, because these programs are relatively new, there is no data about job placement and current employment. In other countries, master's programs in gerontology are seen as a requirement to move toward a PhD in gerontology (Sterns & Ferraro, 2008). To date there are no doctoral programs in gerontology or aging studies in Mexico. There is not enough information to identify whether master students are pursuing other doctoral programs available in Mexico or whether they are going to other countries. Evaluation of these programs is needed to determine their effectiveness.

Current challenges in gerontology education in Mexico

Like other countries, gerontology in Mexico has faced some constraints that challenges the field (García Ramírez, 2015). There are still some language problems, along with issues in theory and concept development. Gerontologists are often seen as support members of disciplinary teams (e.g., doctors, social workers, and psychologists). This is partially due to the fact that the initial curriculum of these programs was heavily centered on operational skills and medical/palliative care, marginalizing gerontological theory and methods. There is a lack of theory development in the field in Mexico. Despite the efforts of multiple gerontological organizations to promote gerontology as an area of study, gerontology and geriatrics are largely combined—sometimes even used interchangeably—in Mexico. In fact, most gerontology programs are led by health care professionals. There is still a need to include social gerontology in the study of aging and move beyond biological aging (Montes de Oca Zavala & Klein Caballero, 2013). An isolated medical approach can no longer account for the complexity and multidisciplinary nature of the aging process. The utilization of sociodemographic data can only lead to better research and policy impact at different levels. To accomplish this Mexico needs to train more personnel who can respond to new aging paradigms, as well as proficient professional and researchers with

masters and doctoral degrees in social gerontology who can observe the social dynamic through different lenses and research the aging phenomenon.

Unfortunately, one of the major problems that Mexico faces is a limited amount of financial and personnel available to train professionals who can produce scientific knowledge, technological development, and the study of social processes the country needs, and gerontology is not the exception (Reyes & Leticia, 2004). Funding for the social sciences is even lower than that for biomedical research. Most of the funding for research in Mexico comes from the National Council on Science and Technology (CONACYT), and in the last decade basic science accounted for about 30% of the total expenditures. In contrast, research related to social, economic, and cultural determinants of health and health policies, systems and services saw a decline of almost 40% (Martínez-Martínez et al., 2012). Overall, researchers have long discussed financial constraints to the development and improvement of postgraduate education and research institutes. Public universities rely mostly on federal and state government funding, and there is no doubt that university budgets are insufficient and represent a serious limitation for hiring qualified educators and researchers. Low wages and salaries in some universities may have discouraged faculty from pursuing further training, and research may have been seen as an additional task for whom faculty were not remunerated, which would limit the number of faculty willing to take on this responsibility. Private-sector support for masters and doctoral programs is directed mostly to small private universities, and almost no private funds are devoted to scientific research in Mexico (Salgado Vega, Miranda González, & Quiroz Cuenca, 2011). Although there are some networks in which scientists from various institutions are involved, research is still fragmented and disjointed. It is evident that more venues for potential collaboration are needed before doctoral programs could be established in Mexico. For this reason, doctoral programs in gerontology are highly unlikely to be developed in the near future.

Mexican institutions moving gerontology forward

In Mexico, the medical field was the pioneer in the study of aging as physicians needed to respond to the demands of an aging population even when they did not have geriatric training (García Ramírez, 2015). With the proliferation of bachelor's and master's degrees in gerontology, the gerontology field is moving forward and achieving an important task of training a new group of students to attend the needs and provide services to older adults in Mexico (Gutiérrez Robledo, 2010). These programs seek to address the social needs of the aging of the population in Mexico, as well as to reduce the negative views of the aging process and reduce stereotypes of older adults. In addition, there will be opportunities for multidisciplinary collaboration as professionals in other areas begin to see the value of aging theory and methods (Villar, 2013).

Educators and researchers in Mexico are creating evidence of the need for gerontologists, as well as traditional professions with gerontological training, psychogerontology, geriatric nursing, and social and community gerontology. This suggests the need for more gerontology departments and/or directors who can establish clear goals and objectives for these programs, as well as the need for training gerontologists that can understand the aging process from a biopsychosocial and spiritual perspective.

We anticipate more opportunities for gerontological research and education with more collaborative work. It appears that gerontology is on its way to becoming an established field of study in Mexico. The field will continue to flourish as it further develops in Mexico. Some gerontology programs are opening their doors to national and international collaborations with leaders in the field of gerontology and geriatrics. Faculty of these programs are participating in international conferences and publishing in gerontology journals. The efforts of gerontological organizations and faculty will be invaluable to increase the numbers of gerontology degree programs at the bachelor's and master's levels, and perhaps for doctoral programs to emerge in Mexico. This will help to increase and improve gerontological research in Mexico.

The growing numbers of gerontologists and aging specialists (practitioners and policy makers) have improved services for older adults in Mexico (Arias, 2013). The Mexican, federal, and state governments are increasing funding in different organizations to promote a culture that understands and meets the needs of older adults. Although the National Institute of Older Persons (*Instituto Nacional de Personas Adultas Mayores*, or INAPAM), which was known as the National Institute for the Elderly (*Instituto Nacional de la Senectud* or INSEN) was created over three decades ago, it has been revamped to provide a wider range of benefits and support for older adults. Earlier INSEN was focused on providing medical care for older adults age 60 and older. Understanding that needs of the aging population include more areas than health care, INAPAM is currently developing programs and directing efforts to not only promote health care, but to provide legal advice, training, and employment options for older adults (Knaul et al., 2002). It provides services such as day care, shelters and senior centers, health and psychological services. INAPAM has published multiple comprehensive reports to improve gerontological education and services for older adults. INAPAM works with different Mexican organizations including Secretariat of Social Development, Secretariat of the Interior, Secretariat of Education, Secretariat of Finance and Public Credit, Ministry of Health, Secretariat of Labor and Social Welfare, National Systems of DIF, IMSS, and ISSSTE (García Ramírez & Flores Cerqueda, 2014; Instituto Nacional de las Personas Adultas Mayores [INAPAM], 2016).

Finally, with the rise in awareness about population aging and civil engagement in Mexico, a number of nongovernmental organizations have been created to provide health care, legal, and social services for older adults (Knaul et al., 2002). These institutions could be instrumental in student engagement when service learning and volunteer opportunities are offered to students.

Conclusions and recommendations

Mexico is facing a number of pressing challenges due to its aging population, such as prevalence of multiple chronic conditions, disability, income inequality, and social vulnerability. Although geriatric and gerontological organizations, academic institutions, and the Mexican government are inspired to satisfy these demands, there is an urgency to stimulate the growth of gerontology and geriatric programs and professionals in Mexico, as well as to assess career patterns and needs of current graduates.

Evidently, funding and resources allocated to these programs are needed. Federal and state governments must increase grant money to support research aligned with current priorities, fund students and faculty, and build capacity in Mexican institutions. However,

Mexico could take advantage and work more effectively with the resources already in place. There are multiple gerontology and geriatrics associations well established in Mexico, but these organizations might need to be strengthened by increasing membership numbers and opportunities for research collaboration. For instance, INGER and INAPAM are two organizations that can facilitate the dialogue between researchers and policy makers. In addition, gerontological researchers in Mexico could become members of gerontological and geriatrics associations in the United States, which has many international members, to connect with other gerontologist and gain more insights about programs and research in their countries.

In advancing the gerontological and geriatrics research agenda, investigators in Mexico need to produce more research that is useful, applied, and policy relevant to the Mexican aging populations. National representative surveys in Mexico such as the Mexican Health and Aging Studies and the Mexican Health and Nutrition Survey are publically available, which could be used by more researchers in Mexico. Faculty would benefit from having some protected time and national and international collaborations fostered by universities. Webinars could also increase interdisciplinary collaboration and training. For instance, international collaboration may provide immediate access to high-impact journals, resources, and personnel that universities in Mexico may not have otherwise. Faculty and students should be encouraged and supported to participate in national and international conferences. At the same time, students should get involved in gerontological and geriatric research, collaborate with established researchers, universities, and organizations and volunteer with older adults.

Unfortunately, it is unknown whether faculty themselves need more training to produce gerontological research and to train other students as independent investigators in the field. An important step is to survey programs and students to identify current practices and needs. In addition, focus groups and/or interviews with program directors would be equally as helpful. This would bring attention and open the floor for discussion regarding gerontology and geriatrics programs in Mexico. Because PhD programs in gerontology in Mexico are not available yet, perhaps faculty members should encourage students to seek doctoral education in the United States and other countries that are open to training international students. For instance, the gerontology program at Miami University of Ohio has trained doctoral students from different countries including Mexico.

The field of gerontology is in a formative phase, and Mexico has a long road to creating more inclusive and integrated research, programs, and policy for older adults. It is necessary to understand what factors are associated with student interest in gerontology and what influences students to select a gerontology program and to pursue careers in aging in Mexico. It is also important to understand why students are not pursuing careers in aging. If the goal is to foster successful careers in aging, a deeper understanding of students' motivations is needed. Perhaps implementing aging courses in high school would initiate interest among those who go to college because students select their majors when applying for college and rarely change schools/majors once they start. This may benefit not only gerontology but also perhaps geriatric programs. Medical schools should offer aging courses to students to influence undergraduate, graduate, and practicing clinicians. It is imperative that universities identify strategies that would make gerontology and geriatrics attractive to students. It is also the responsibility of gerontologists and

geriatricians to speak about aging and aging-related issues in their communities. Their important work should be disseminated in undergraduate and graduate programs in Mexico.

The task is not to divide scientific disciplines that study different aspects of aging but rather to establish multidisciplinary work, where geriatricians and gerontologists contribute knowledge to improve Mexican older adults' lives. In light of the history of geriatrics and gerontology in Mexico, it is hoped that this article will contribute and open up a wider discussion about gerontology and geriatrics education in Mexico. As we have discussed, gerontology and geriatrics education and research in Mexico continue to develop and establish a presence in Mexico. Yet more efforts are needed to provide additional expansion and further resource development in these fields.

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