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Examining Fall Recurrence Risk of Homebound Hispanic Older Adults Receiving Home Care Services

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Abstract

Introduction: Unintentional falls and injuries is a major problem among older adults and the fourth cause of death in the United States. A previous fall event doubles the risk of recurrence and lessens the person's quality of life. Hispanic older adults have higher rates of disability and lower independent functioning due to poor medical health and risk for fall recurrence. Most fall studies focus on fall risk with few studies on fall recurrence in older adults receiving home health care services unrelated to fall incident.

Method: A descriptive pilot study of 30 homebound Hispanic older adults receiving home care services who reported a fall within 3 months was conducted by a multidisciplinary team to evaluate risk of fall recurrence.

Results: A heightened risk for fall recurrence was identified with high number of chronic illnesses, high intake of medications, vision problems, and prevalence of urinary incontinence.

Conclusion: Findings highlight significant number of intrinsic factors for fall risk recurrence and injuries in a Hispanic older adults population that is homebound and receiving home care services. A multidisciplinary evaluation and culturally appropriate interventions to lessen the risk of fall recurrence are recommended.

Keywords

Hispanics; older adults; homebound; home care services; fall recurrence; multidisciplinary team

Introduction

Unintentional falls and related injuries are a major health problem among the aging population and is the fourth leading cause of death in the United States (Centers for Disease Control and Prevention [CDC], 2016). Direct medical costs totaled \$616.5 million for fatal and \$30.3 billion for nonfatal injuries in 2012 and rose to \$637.5 million and \$31.3 billion,

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respectively, in 2015 (CDC, 2016). Fall incidence as well as total cost increased with age (Burns, Stevens, & Lee, 2016; Stevens, Corso, Finkelstein, & Miller, 2006). The incidence of falls is proportionately higher in persons 80 years and older with escalating propensity of untimely death (Inouye, Studenski, Tinetti, & Kuchel, 2007; Tinetti & Kumar, 2010). Often overlooked is the incidence of recurrent falls and injuries, which doubles the likelihood of falling again; a recurrent fall heightens the potential for disability and affects the quality of life (Karlsson, Vonschewelov, Karlsson, Coster, & Rosengen, 2013; Lam et al., 2016). Most fall studies focus on general fall risk, with few studies exploring fall recurrence specifically among persons who are already receiving home health care services unrelated to fall incidence (Lam et al., 2016; Leclerc et al., 2009; Tinetti & Kumar, 2010).

Hispanic older adults are projected to be the largest ethnic minority population in the United States by the year 2060 (Administration for Community Living [ACL], 2015). Older Mexican Americans, the largest group of Hispanics, have a higher rate of disability due to their poor medical health as compared to other groups (ACL, 2015; Salinas, Su, & Al Snih, 2013). This high incidence of chronic illness and related disability increases the risk for recurrent falls among an older adult population with limited resources (National Hispanic Council on Aging, 2012; Vasilopoulos et al., 2014). Hispanics tend to have relatively lower education and income levels with greater needs for self-care assistance due to chronic illness (Landy, Mintzer, Silva, Dearwater, & Schulman, 2012; Landy, Mintzer, Silva, & Schulman, 2011). The disproportionate prevalence of diabetes and related complications such as renal disease, visual impairments, and lower extremity amputation contribute substantially to the risk for falls and its recurrence among Hispanics (Anders et al., 2008; Reed-Jones et al., 2013).

Purpose

Although there are known intrinsic and extrinsic factors influencing individual fall risk, a predictor for recurrent fall is a previous fall (CDC, 2016; Leclerc et al., 2009). Home health care services assist individuals who have experienced a fall for prevention of fall injury recurrence. The purpose of this pilot study was to assess the risk for fall recurrence among Hispanic persons who were receiving home care services and reported a recent fall. This assessment will inform development of prevention measures to reduce fall recurrence among individuals receiving home care services.

Method

Design and Setting

This descriptive study included homebound Hispanic older adults who were receiving home care services and reported experiencing a fall injury during the past 3 months. Only Hispanics were included in the sample as they comprise a population at increasing risk for fall injury. The study was conducted in a metropolitan area on the U.S.–Mexico border where Hispanics constitute 80% of the population. A fall injury was defined as an unintentional incident in which a person comes to rest on the floor of another lower level (World Health Organization, 2012). Homebound was defined as the person being confined to home because of an illness or injury related condition that prevents the person from leaving

his or her home under usual/normal circumstances (Centers for Medicare & Medicaid Services, 2014).

Study Population and Recruitment

Study participants were recruited from two home care agencies. Home care clients were eligible for the study if they were 55 years old or older; self-identified as Hispanic, Latino (or Latina), Mexican, or Mexican American; and self-reported a fall within the past 3 months. This age range was selected due to the high incidence of type 2 diabetes and associated complications among Hispanics contributing to fall risk in this age-group (Anders et al., 2008). A recurrent fall was documented by self-report of individuals disclosing the incident during a routine home health care visit or as follow-up to a specific event warranting evaluation. This incident was documented in medical records using a fall recurrence code/diagnosis. Potential participants with documented diagnoses of dementia were excluded.

A fall recurrence diagnosis was identified via chart review by the home care nurse who contacted potential study participants in adherence to the Health Insurance Portability and Accountability Act protection regulation. Phone numbers for clients meeting the inclusion criteria and who agreed to be contacted for possible participation in the study were provided to the research assistant (RA). A bilingual RA subsequently contacted potential participants, via telephone, to confirm that they met inclusion criteria; explained the study; and made arrangements to complete the research enrollment process.

Study Procedure

The study was approved by the institutional review board of The University of Texas at El Paso. The study procedures included two home visits, each lasting approximately 90 minutes. Informed consent was obtained in the participant's preferred language during the first visit. Following obtainment of informed consent, two RAs from nursing and pharmacy completed an interview focused on medical history and objective evaluation of clinical measures. The second visit occurred within 48 hours after the first. Two RAs from occupational therapy and social work obtained socioeconomic, cultural, and mobility information/testing at this visit. The assessments were divided into two visits to accommodate the participants' potential fatigue. Participants received a \$20.00 incentive for participating in the study on completion of the second visit.

Instruments/Measures

The study questionnaires included a self-report of sociodemographic and health information such as age, gender, ethnicity, education, language preference, reading, and writing proficiency, identification of chronic illnesses, medication use, description of the most recent fall event, and health service usage after falling. The variables derived from the measures used in the study have been identified as risks for falls and recurrence when problems are not corrected (American Geriatrics Society & British Geriatrics Society, 2010; Tinetti, Gordon, Sogolow, Lapin, & Bradley, 2006).

The presence of comorbidity and polypharmacy is an established and significant risk for falls (Brito, Coqueiro Rda, Fernandes, & de Jesus, 2014; Gelbard et al., 2014). The self-report of illness was elicited through questions beginning, "Have you ever been told by a doctor, nurse, or other health professional that you have [...]" statement included in the Behavioral Risk Factor Surveillance System questionnaire (CDC, 2013) and one of a list of 15 health conditions guided by the Charlson comorbidity index (Charlson, Pompei, Ales, & MacKenzie, 1987). Urinary incontinence was included as an independent question because of the prevalence of incontinence in chronic illness and a fall risk (Vasilopoulos et al., 2014). An inventory of medications, prescribed and non-prescribed, was conducted during the first visual with visual verification by the RA.

The Medication Understanding and Use Self-Efficacy (MUSE; Cameron et al., 2010) scale was administered to provide insight regarding the understanding and use of prescription medications. Improper intake and understanding of medications have been linked to falls (Sergi, De Rui, Sarti, & Manzato, 2011; Sirey, Greenfield, Weinberger, & Bruce, 2013). The results of the MUSE score were used to assess this fall risk. The MUSE is a valid and reliable instrument used in clinical and research settings to evaluate individual self-efficacy related to understanding and using prescribed medications. This instrument contains two subscales. The first subscale has four items that assess self-efficacy related to taking medications, including a patient's ability to remember to take medications on time and to set schedules for managing medications. The other four-item subscale assesses a person's ability to learn about medications by reading labels and asking questions about medications. Points are assigned to each response up to a total of 32 points. Higher scores on the MUSE scale indicate higher levels of self-efficacy related to medication use. The readability of the scale items is at the sixth-grade level. The questionnaires were read to the participants, in the preferred language (English/Spanish), and their responses recorded by the research assistants.

Older adults often experience visual impairment, which contributes to falls by interfering with the detection of environmental hazards thereby preventing performance of activities of daily living (Reed-Jones et al., 2013). Visual acuity was evaluated using the Snellen scale eye chart, commonly used in outpatient settings. Acceptable vision is described as equal to or less than 20/40 feet; significant impairment is 20/200 feet (U.S. National Library of Medicine, 2015). Measurements were taken of right eye, left eye, and both eyes, corrected and uncorrected. Evaluating visual acuity in the participant's home provided opportunity to observe whether corrective lenses, when available, were being used. Older adults have been found to avoid wearing corrective lenses in familiar environment thus creating fall risk and recurrence (Reed-Jones et al., 2013).

The Timed Up and Go (TUG) test, used to measure balance and functional mobility, was administered by an RA. This test has a prediction rate of 90% for mobility impairment (Beauchet et al., 2011). Time taken to complete the task is correlated with level of function and mobility. The cutoff level for TUG is 13.5 seconds with longer time indicating mobility problems (Shumway-Cook, Brauer, & Woollacott, 2000). Participants were timed on rising from an armless chair, walking 3 meters, turning around, walking back, and sitting down. Three independent cycles were completed, and results averaged to produce a score. Mobility

impairment is a major risk for falls and recurrence. Approximately one of every three older adults report problems with walking and balance; those older than 75 years of age are affected more often (Karlsson et al., 2013).

Statistical Analyses

Descriptive statistics were used to identify frequencies and measurement of continuous variables for mean and standard deviation and for categorical variables determining percentages. SPSS Version 20 statistical analysis program was used for computation.

Results

Fifty-five potential participants were contacted of which 30 (54.5%) consented to participate. Reasons potential participants cited for not participating in the study included the inability to accommodate two visits from the research team, conflicting personal schedule, and skepticism about participating in research. Thirty Hispanic older adults 55 years and older were included.

The majority of participants were over 75 years ($n = 20$, 67%) with ages ranging from 58 to 91 years, were female, and identified being of Mexican descent (70%) with eighth-grade education level. Language preference was predominantly Spanish, with 23% bilingual in English and Spanish. Of those participants who identified Spanish as their primary language, 80% self-reported a “high proficiency” level in reading and writing, while the English-primary speakers self-reported a 57% “high proficiency” level (Table 1). The number of illnesses reported by participants ranged from 2 to 13 (6.4 $\pm$ 3.0), with arthritis (77%) and hypertension (77%) reported most frequently, followed by osteoporosis (70%), diabetes (60%), and hypercholesterolemia (57%; Table 2). The presence of urinary incontinence was reported by 12 participants (40%).

Participants ($n = 27$) reported taking an average of 8.3 ($\pm$ 4.6) prescribed medications, with a range of 1 to 19 medications. All 30 participants reported using nonprescription products (alternative medications, supplements, and over-the-counter medications) for an average of 3.9 ($\pm$ 3.0) products; the number ranged from 1 to 13 prescription and nonprescriptions. Medical care related to fall event was sought by majority of participants ($n = 14$, 47%) with emergency room being the most commonly accessed service ($n = 11$, 37%).

The majority of participants ($n = 23$, 77%) had been prescribed corrective glasses. As discussed earlier, visual acuity was evaluated with and without prescription lenses for both eyes together and individually. Results were organized into two categories describing impairment: moderate equal or more than 20/40 feet but less than 20/200 feet, and significant equal or more than 20/200 feet. Evaluation of those with uncorrected unilateral vision showed greater impairment: 67% had moderate and 17% had severe impairment. Of those with corrected unilateral vision, 53% had moderate while 10% had severe impairment. Many participants admitted to wearing glasses only when outside the home.

The MUSE score ranged from 14 to 32 (28.8 $\pm$ 4.4) and indicated participants were proficient in understanding and using their medications. Mobility was evaluated by

averaging three measured TUG scores, and results demonstrated a range from 4.9 to 35 seconds (13.9 ± 7.7). The results of visual acuity test, TUG, and MUSE scores with respective norms are listed in Table 3.

Discussion

This study provides an opportunity to evaluate risk for fall recurrence in homebound individuals who are receiving home health services. In general, the participants in this study experienced a heightened fall recurrence risk due to chronic illness and medications.

Polypharmacy has been identified as a major fall risk (Brito et al., 2014; Chang & Do, 2015). Individuals often do not report non-prescription medications to health care providers, thereby potentiating morbidity and mortality due to falls and recurrence. The high intake of prescribed and non-prescribed medications seen in this study represents an enhanced fall risk for this group. The prevalence of polypharmacy, defined as taking four or more medications, has been recognized as a fall risk and its recurrence because of the possible adverse effect, drug-to-drug interaction, and the impact of the medication in the disease process, which may impair judgement, balance, and strength (Tinetti et al., 2006; Zia, Kamaruzzaman, & Tan, 2015). The number of medications used by participants in this study was 3 times greater than what is considered to create fall risk due to potential multiple drug interactions and adverse drug effect (Sergi et al., 2011).

The high score obtained on the self-efficacy scale (MUSE) shows that participants were confident in understanding and using their prescribed medications, but these results do not necessarily reflect the participants' level of medication adherence, which is a concern and is beyond the scope of this study. The MUSE score is based on self-perception of abilities related to medication use, and it is not an objective assessment of medication adherence. Additionally, the MUSE does not allow for direct observation of medication intake, and researchers relied on self-report of how medications are taken. It is possible that the person's perception may differ from actual practice of appropriately taking the medications, especially when there are complicated dosing regimens or when regimens contain many medications. Studies suggest that poor medication adherence in older adults may be as high as 50%, especially in those with diabetes, and that poor adherence has been a contributing factor in falls (Berry et al., 2010; Sirey et al., 2013). Formally assessing medication adherence among Hispanic older adults may offer additional insight into medication intake as they pertain to fall risk.

Urinary incontinence was common among participants in our study, who did not recognize this as a health problem. Urinary incontinence among older adults, often overlooked by those affected, is linked to falls (Chiarelli, Mackenzie, & Osmotherly, 2009). Urinary incontinence in aging has been linked to urologic, neurologic, psychological, and functional factors. The loss of detrusor muscle, an increase in residual urine, and a decrease in functional bladder capacity are contributors to urinary incontinence (Inouye et al., 2007). Urge incontinence, overactive bladder, and nocturia influence the person's quality of life and impedes functionality, which creates a fall risk (Chiarelli et al., 2009). A history of falls and urinary incontinence places a person at greater risk for health problems and is identified as

part of *geriatric syndrome*, a term used to list common health conditions that are interrelated and linked to poor health state and frailty in older adults (Inouye et al., 2007; Leclerc et al., 2009). The presence of urinary incontinence warrants assessment and treatment to prevent further complications.

Our findings of unilateral significantly abnormal visual acuity (more than 20/200 feet) points to a greater propensity for fall risk and highlights the importance of comprehensive eye exams on a regular basis to identify common types of visual impairment, such as cataract, glaucoma, and macular degeneration (Reed-Jones et al., 2013; U.S. National Library of Medicine, 5). These conditions may not be identified when visual acuity is tested only in both eyes and highlights the need to follow the recommendations by American Academy of Ophthalmology for yearly eye exams to test each eye separately and to conduct yearly exams in older adults. Participants in this study described wearing lenses only “when needed,” indicating the need for health care providers to emphasize use of corrective lenses even when at home, to prevent fall recurrence.

According to the TUG score of 13.5 seconds or less is acceptable for community-dwelling adults (Shumway-Cook et al., 2000). The persons in the research study exhibited limitations with mobility. The average score is, however, less than 1 second above the listed score; moreover, in view of this group’s advanced age, high number of reported chronic illnesses, and high intake of medications, mobility problems were relatively low. The TUG score alone could not be construed as a contributing fall risk: rather, the cumulative factors must be taken into account.

Hispanic older adults have been described as having lower socioeconomic status, which has been linked to poor health outcomes, and yet the mortality rate associated with some health conditions and with falls is lower than non-Hispanic Whites (ACL, 2015; CDC, 2016; Landy et al., 2012). The *Hispanic mortality paradox* is a term used in reference to the advantage of Hispanic older adults of having extended longevity as compared to non-Hispanic Whites despite the low socioeconomic status and poor health (Markides & Eschbach, 2005; Ruiz, Steffen, & Smith, 2013; Thomson, Nuru-Jeter, Richardson, Raza, & Minkler, 2013). Although the mortality rate may be lower in Hispanic older adults, the disability rate is higher than other ethnics groups and especially in persons living along the U.S.–Mexico border (ACL, 2015; Salinas et al., 2013).

In this study, the results of the TUG score indicate that function is not greatly affected despite the high prevalence of chronic illness, presence of conditions considered within the geriatric syndrome, and high intake of medications. On the other hand, the percentage of individuals who sought medical care from fall-related injuries indicates greater incidence of injury than national data report of 30% (CDC, 2016).

This study points to an aging Hispanic population that has a large number of chronic illnesses, higher intake of medications, and low visual acuity, which align with poor health and fall risk. On the other hand, the high level of self-confidence in medication use and the minimal limitation of mobility point to good functioning level that may guard against recurrent fall.

Conclusion

This study highlights the significant number of contributing intrinsic risk factors for fall recurrence and injuries in this Hispanic population, which warrants comprehensive evaluation of levels of function and independence as greater incidence of potential disability may be identified. It is imperative that awareness of fall risk recurrence be raised among health care practitioners to start conversation on fall occurrence and to spur appropriate action, which requires collaboration of various health professionals to design appropriate individualized prevention interventions. Educating older adults on fall risks is only a part of an intervention program and needs to be incorporated with additional content that addresses mobility, proper intake of medications, evaluation and management of visual deficits, and environment and behavior modifications. We suggest developing or implementing validated community-based fall prevention programs (American Geriatrics Society & British Geriatrics Society, 2010; CDC, 2016). Clinical implications derived from this study include alertness on the part of health care practitioners to identify persons taking more than five medications or having multiple comorbidities as potential fall risks, so that practitioners may initiate an action plan to prevent fall and injury while maintaining a person's overall function and minimize disability. It is important to emphasize to older adults and health care practitioners, as part of the recommended annual exam of older adults, the importance of an exam that extends beyond the routine objective measures and includes evaluation of functional ability and safety issues with appropriate recommendations.

The information derived from this study is limited by the study's small sample size, convenience sample design, limited objective evaluations of mobility and balance, and an assessment of home/environment. Researchers can strengthen the evaluation of fall recurrence risk factors in Hispanic older adults by evaluating comparative groups within the community with larger samples, direct observation of medication intake practices, and most important, an evaluation of environmental recurrent fall hazards. Despite the limitations mentioned, this study adds to the knowledge of contributing fall risks of Hispanic older adults and sets the stage for future studies. Interventions that would follow to prevent falls in this ethnic group would need to be designed in language and cultural practice appropriate for this ethnic group, with a multidisciplinary approach in order to effectively reach goals for reducing recurrent falls and injuries.

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References

- Administration for Community Living. (2015). Administration on aging. A statistical profile of Hispanic older Americans aged 65+. Retrieved from http://www.aoa.acl.gov/Aging_Statistics/minority_aging/Facts-on-Hispanic-Elderly.aspx
- American Geriatrics Society & British Geriatrics Society. (2010). Panel on prevention of falls in older persons. Summary of the updated American Geriatrics Society/British Geriatrics Society clinical practice guideline for prevention of falls in older persons. *Journal of American Geriatrics Society*, 59(1), 148–157. doi: 10.1111/j.1532-5415.2010.03234.x

- Anders RL, Olson T, Wiebe J, Bean NH, DiGregorio R, & Guillermina M (2008). Diabetes prevalence and treatment adherence in residents living in a colonia located on the West Texas, USA/Mexico border. *Nursing & Health Science*, 10, 195–202. doi: 10.1111/j.1442-2018.2008.00397.x
- Beauchet O, Fantino B, Allali G, Muir SW, Montero-Odasso M, & Annweiler C (2011). Timed Up and Go test and risk of falls in older adults: A systematic review. *Journal of Nutrition, Health & Aging*, 15, 933–938. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/22159785>
- Berry SD, Quach L, Procter-Gray E, Kiel DP, Li W, Samelson EJ, Kelsey JL (2010). Poor adherence to medications may be associated with falls. *Journals of Gerontology: Series A, Biological sciences and medical sciences*, 65, 553–558. doi: 10.1093/gerona/glq027
- Brito TA, Coqueiro Rda S, Fernandes MH, & de Jesus CS (2014). Determinants of falls in community-dwelling elderly: Hierarchical analysis. *Public Health Nursing*, 31, 290–297. doi: 10.1111/phn.12126 [PubMed: 24862435]
- Bums ER, Stevens JA, & Lee R (2016). The direct costs of fatal and non-fatal falls among older adults —United States. *Journal of Safety Research*, 58, 99–103. doi: 10.1016/j.jsr.2016.05.00 [PubMed: 27620939]
- Cameron KA, Ross EL, dayman ML, Bergeron AR, Federman AD, Bailey Cooper, Wolf MS (2010). Measuring patients' self-efficacy in understanding and using prescription medication. *Patient Education and Counseling*, 80, 372–376. doi:10.1016/j.pec.2010.06.029 [PubMed: 20650594]
- Centers for Disease Control and Prevention. (2013). Behavioral Risk Factor Surveillance System Questionnaire. Retrieved from <http://www.cdc.gov/brfss/questionnaires.htm>
- Centers for Disease Control and Prevention. (2016). Important facts about falls. Retrieved from <http://www.cdc.gov/homeandrecreationalsafety/falls/adultfalls.html>
- Centers for Medicare & Medicaid Services. (2014). Definition of homebound patient under the medicare home health (HH) benefit (Pub 100–02 Medicare Benefit Policy). Retrieved from <https://www.cms.gov/Regulations-and-Guidance/Guidance/Transmittals/downloads/R192BP.pdf>
- Chang VC, & Do MT (2015). Risk factors for falls among seniors: Implications of gender. *American Journal of Epidemiology*, 181, 521–531. doi:10.1093/aje/kwu268 [PubMed: 25700887]
- Charlson ME, Pompei P, Ales KL, & MacKenzie CR (1987). A new method of classifying prognostic comorbidity in longitudinal studies: development and validation. *Journal of Chronic Diseases*, 40, 373–383. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/3558716> [PubMed: 3558716]
- Chiarelli PE, Mackenzie LA, & Osmotherly PG (2009). Urinary incontinence is associated with an increase in falls: A systematic review. *Australian Journal of Physiotherapy*, 55(2), 89–95. [PubMed: 19463079]
- Gelbard R, Inaba K, Okoye KT, Morrell M, Saadi Z, Lam L, Demetriades D (2014). Falls in the elderly: A modern look at an old problem. *American Journal of Surgery*, 208, 249–253. doi: 10.1016/j.amjsurg.2013.12.034 [PubMed: 24814307]
- Inouye SK, Studenski S, Tinetti ME, & Kuchel GA (2007). Geriatric syndromes: Clinical, research, and policy implications of a core geriatric concept. *Journal of the American Geriatrics Society*, 55, 780–791. doi: 10.1111/j.1532-5415.2007.01156.x [PubMed: 17493201]
- Karlsson MK, Vonschewelov T, Karlsson C, Coster M, & Rosengen BE (2013). Prevention of falls in the elderly: A review. *Scandinavian Journal of Public Health*, 41, 442–454. doi: 10.1177/1403494813483215 [PubMed: 23554390]
- Lam C, Kang JH, Lin HY, Huang HC, Wu CC, & Chen PL (2016). First fall-related injuries requiring hospitalization increase the risk of recurrent injurious falls: A nationwide cohort study in Taiwan. *PLoS One*, 11(2), e0149887. doi: 10.1371/journal.pone.0149887 [PubMed: 26900917]
- Landy DC, Mintzer MJ, Silva AK, Dearwater SR, & Schulman CI (2012). Hispanic ethnicity and fatal fall risk: Do age, gender, and community modify the relationship? *Journal of Surgical Research*, 175, 113–117. doi: 10.1016/j.jss.2011.02.035 [PubMed: 21529828]
- Landy DC, Mintzer MJ, Silva AK, & Schulman CI (2011). Hispanic ethnicity and unintentional injury mortality in the elderly. *Journal of Surgical Research*, 166(1), 28–31. doi: 10.1016/j.jss.2010.04.02 [PubMed: 20828734]
- Leclerc BS, Begin C, Cadieux E, Goulet L, Allaire JF, Meloche J, Kergoat MJ (2009). A classification and regression tree for predicting recurrent falling among community-dwelling seniors using home-care services. *Canadian Journal of Public Health*, 100, 263–267.

- Markides KS, & Eschbach K (2005). Aging, migration, and mortality: Current status of research on the Hispanic paradox. *Journals of Gerontology. Series B, Psychological Science and Social Sciences*, 60(2), 68–75. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/16251594>
- National Hispanic Council on Aging (NHCOA). (2012). State of Hispanic Older Adults: An Analysis and Highlights from the Field. Executive summary. Retrieved from: <http://www.nhcoa.org/wp-content/uploads/2012/10/State-of-Hispanic-Older-Adults-Brief-2012-.pdf>
- Reed-Jones RJ, Solis GR, Lawson KA, Loya AM, Cude-Islas D, & Berger CS (2013). Vision and falls: A multidisciplinary review of the contributions of visual impairment to falls among older adults. *Maturitas*, 75(1), 22–28. doi:10.1016/j.maturitas.2013.01.019 [PubMed: 23434262]
- Ruiz JM, Steffen P, & Smith TB (2013). Hispanic mortality paradox: A systematic review and meta-analysis of the longitudinal literature. *American Journal of Public Health*, 103(3), e52–e60. doi: 10.2105/AJPH.2012.301103
- Salinas JJ, Su D, & Al Snih S (2013). Border health in the shadow of the Hispanic paradox: Issues in the conceptualization of health disparities in older Mexican Americans living in the southwest. *Journal of Cross-Cultural Gerontology*, 28, 251–266. doi: 10.1007/s10823-013-9202-9 [PubMed: 23846801]
- Sergi G, De Rui M, Sarti S, & Manzato E (2011). Polypharmacy in the elderly: Can comprehensive geriatric assessment reduce inappropriate medication use? *Drugs & Aging*, 28, 509–518. doi: 10.2165/11592010-000000000-00000 [PubMed: 21721596]
- Shumway-Cook A, Brauer S, & Woollacott M (2000). Predicting the probability for falls in community-dwelling older adults using the Timed Up & Go Test. *Physical Therapy*, 80, 896–903. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/10960937> [PubMed: 10960937]
- Sirey JA, Greenfield A, Weinberger MI, & Bruce ML (2013). Medication beliefs and self-reported adherence among community-dwelling older adults. *Clinical Therapeutics*, 35, 153–160. doi: 10.1016/j.clinthera.2013.01.001
- Stevens JA, Corso PS, Finkelstein EA, & Miller TR (2006). The costs of fatal and non-fatal falls among older adults. *Injury Prevention*, 12, 290–295. doi:10.1136/ip.2005.011015 [PubMed: 17018668]
- Thomson EF, Nuru-Jeter A, Richardson D, Raza F, & Minkler M (2013). The Hispanic Paradox and older adults' disabilities: Is there a healthy migrant effect? *International Journal of Environmental Research and Public Health*, 10, 1786–1814. doi:10.3390/ijerph10051786 [PubMed: 23644828]
- Tinetti ME, Gordon C, Sogolow E, Lapin P, & Bradley EH (2006). Fall-risk evaluation and management: Challenges in adopting geriatric care practices. *The Gerontologist*, 46, 717–725. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/17169927> [PubMed: 17169927]
- Tinetti ME, & Kumar C (2010). The patient who falls: "It's always a trade off." *Journal of the American Medical Association*, 303, 258–266. doi:10.1001/jama.2009.2024 [PubMed: 20085954]
- U.S. National Library of Medicine. (2015). Visual acuity test. Retrieved from <http://www.nlm.nih.gov/medlineplus/ency/article/003396.htm>
- Vasilopoulos T, Kotwal A, Huisingh-Scheetz MJ, Waite LJ, McClintock MK, & Dale W (2014). Comorbidity and chronic conditions in the National Social Life, Health and Aging Project (NSHAP), Wave 2. *Journals of Gerontology. Series B, Psychological Sciences and Social Sciences*, 69(Suppl. 2), S154–S165. doi: 10.1093/geronb/gbu025
- World Health Organization. (2012). Falls: Fact Sheet No. 344. Retrieved from <http://www.who.int/mediacentre/factsheets/fs344/en/>
- Zia A, Kamaruzzaman SB, & Tan MP (2015). Polypharmacy and falls in older people: Balancing evidence-based medicine against falls risk. *Postgraduate Medicine*, 127(3), 330–337. doi: 10.1080/00325481.2014.996112. [PubMed: 25539567]

Table 1.

Participants' Characteristics.

Variable	Results, <i>n</i> (%)	<i>N</i>
Age, years, <i>M</i> (<i>SD</i>) Gender	77.3 ($\pm$ 6.4)	30
Males	6 (20)	
Females	24 (80)	
Education		28
K-6	7 (25)	
7-9	11 (39)	
9-12	10 (36)	
Primary language		30
English	9(23)	
Spanish	11 (43)	
Both	10 (33)	
illnesses, ^a <i>M</i> (<i>SD</i>)	$\bar{x}$ 6.4 ($\pm$ 3.0)	30
Prescription medications, ^b <i>M</i> (<i>SD</i>)	$\bar{x}$ 8.3 ($\pm$ 4.6)	30

^aRange of illnesses: 2-13.

^bRange of prescription medications 1-19.

Table 2.Top 10 Illness ($N=30$).

Illness	<i>n</i>	%
Arthritis	23	77
Hypertension	23	77
Osteoporosis	21	70
Diabetes	18	60
High cholesterol	17	57
Anxiety	13	43
Insomnia	9	30
Depression	8	27
Heart disease	8	27
Poor circulation	6	20

Table 3.

Fall Risk Measures.

Instrument	Normal	Result
Snellen vision test	20/40	
Uncorrected ^a		
20/40 but <20/200		20
20/200		I
Corrected		
20/40 but <20/200		II
20/200		None
Medication Understanding and Use Self-Efficacy Scale ^b	0–32	28.8 (±4.4)
Timed Up and Go ^c	>13.5 seconds	13.9 (±7.7) seconds

^aBoth eyes, without glasses. Distance measured in feet.

^bThe higher the score, the greater the self-efficacy of medication use: range 14–32.

^cCutoff scores for community-dwelling older adults (Shumway-Cook et al., 2000).