

# Understanding Falls Risk and Impacts in Chinese American Older Patients at a Community Health Center

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**Abstract** While falls are highly prevalent and costly for older adults, little is known about falls for Asian Americans. Using a custom, evidence-based, bilingual fall risk assessment and management tool, our study examined the prevalence of falls among older Chinese-speaking patients at a community health center. We identified the risks for falls and explored an association of fall risk with emergency room (ER) and hospital use in this population. The setting was at a community health center in Oakland, CA. Participants included 839 older Asian American adults (ages 65–80 years) who spoke Cantonese/Mandarin. Primary care clinic staff administered a fall risk assessment and management tool at the time of clinic visits to assess patients' risk factors for falls. Of the total, 173 (20.6%) reported having fallen in the past year, with women comprising a majority (71.7%). 362 patients in the cohort (43.1%) reported fear of falling. For the subset of Medicaid managed care patients ( $n=455$ , 54.3% of total) for whom we were able to obtain ER and hospital utilization data, 31 patients (14.5%) who reported a fall risk had an ER/hospital episode compared to 15 (6.2%) of those who did not self-report fall risks (statistically significant,  $p<0.05$ ). A targeted fall risk assessment and management tool designed by community-based primary care practitioners and utilized with linguistic and cultural competence to focus on Asian American older adults, can help establish the prevalence of falls in this understudied population and effectively identify those at higher risk for falls and subsequent ER/hospital utilization. More research is needed to understand

the risk and impacts of falls in understudied populations and identify ways to prevent these costly falls.

**Keywords** Falls · Chinese Americans · Elderly · Patients

## Introduction

Falls are highly prevalent events that are costly to both older adults and the healthcare system. In the United States, nearly one-third of adults 65 years and older fall each year and the rate increases to 50% for those over 80 years of age, often with resultant loss of independence [1–3]. Falls are the most common cause of nonfatal, trauma-related hospitalization in older adults, and at least 10–15% of falls result in major injuries such as fractures or brain injuries [4–7]. Falls are also the leading cause of older adult death due to injury in the U.S., with over 20,000 deaths per year [8].

With more than 700,000 hospitalizations and greater than 2.5 million emergency room (ER) visits per year for related injuries, falls in older adults place a tremendous economic burden on the United States healthcare system [8]. In 2000, falls resulting in injury or death cost the U.S. healthcare system over \$19 billion in direct medical expenses [9]. With the increase in older adult populations in the U.S., this cost is expected to rise to more than \$54.7 billion (adjusted to 2007 dollars) by 2020 [9].

Among the rapidly rising older adult population nationally, minorities constitute the fastest-growing segment. In fact, the Asian American (AA) older population increased 145% between 2000 and 2010 [10]. CA has both the greatest number of older adults and the most AA age 65 or older than any other state [11, 12]. Despite these rapidly changing demographic trends, the medical community in the U.S. has been slow to prepare for the cultural and linguistic

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diversity of our aging population. For AA immigrant elderly, approximately two-thirds of whom are foreign-born [10], the impact of geriatric conditions is further magnified by a multiplicity of socioeconomic factors, including limited English proficiency, low income status, lower acculturation levels, and lower health literacy. AA older immigrants thus often lack the financial resources and the linguistic and cultural skills necessary to access diagnostic and treatment resources for their health problems [13]. On a population health level, there remains a great gap in understanding the basic epidemiology and impact of falls on these difficult-to-reach and vulnerable older AA populations. To date, research on falls generally has not included large numbers of AAs and we have found no published studies on falls conducted within community care settings in the U.S. focused on older AAs. There is thus a paucity of published literature on effective falls prevention models targeting community-dwelling AA, specifically Chinese American older adults residing in the U.S. [14].

To help address the data gap on the frequency and impact of falls among older AAs, our project aimed to describe the prevalence of falls among older, Chinese-speaking AA adults served within a community primary care clinic setting, and examine preliminary data on the association between falls risk and utilization of emergency rooms and hospitalizations in this population.

## Methods

### Setting

Community health centers (CHC) constitute a main health care safety net for medically underserved populations and provide primary care to more than 25 million patients nationwide. Compared to the U.S. low-income population overall, CHC patients tend to be poorer, more racially and ethnically diverse, and more likely to be unemployed [15]. CHCs are increasingly important primary care providers to older adults, especially immigrant older adults and play a significant role in improving health outcomes and containing costs in these populations [16].

Asian Health Services (AHS) is a federally-qualified community health center (FQHC) in Oakland, CA that provides culturally-competent and linguistically-concordant medical care, behavioral health services, dental care, health education, insurance counseling, and client advocacy to more than 27,000 patients, mostly immigrant Asian Americans and Pacific Islanders. AHS is the main provider of health services to older Asian Americans in Alameda County, CA, serving almost 7000 AA older adults. AA older adults (65 years and older) constitute more than 20% of AHS' patient population, representing a much higher

proportion on average than the 6.9% of older adults seen in other FQHCs nationwide. Among AHS' Chinese patients, who comprise more than two-thirds of AHS' total patient population, older patients constitute over 72%. Responding to the complex and diverse health needs of these older patients, AHS embarked in 2012 on developing and implementing a targeted, evidence-based risk assessment and management tool to address falls as an important geriatric syndrome.

### Assessment Tool and Development

In order to assess the risk and prevalence of falls in AHS' Chinese-speaking AA older adults, we developed a 1-page falls risk assessment and management tool for our primary care clinics (see Appendix 1) which includes two brief questions to the patient (Questions 1 and 2), additional risk factor assessments to be performed by the medical assistant if patient response is positive to either Question 1a or 2, and a set of falls risk management recommendations for the clinician. To support implementation of the tool, AHS also developed a falls risk management curriculum for its clinicians and clinical staff. Multiple didactic and experiential case study learning sessions were conducted and included reviewing evidence-based falls screening and management strategies as well as multidisciplinary exercises administering and applying AHS' tool and proper assessment techniques for timed gait testing and mobility aid adjustments. Both the assessment tool and curriculum were developed in consultation with the UCSF Northern California Geriatric Education Center (Nor-Cal GEC) faculty members. Importantly, Questions 1 and 2 on the tool for patient self-report were translated into Chinese using a forward- and back-translation technique.

AHS' tool assesses for the strongest evidence-based risk factors predisposing older adults to falls: history of previous falls, patient's perceived fear of falling, gait and visual impairments, orthostasis, and polypharmacy [17, 18]. AHS' tool also provides evidence-based multi-component recommendations for clinicians on management of fall risk. A multitude of prior studies examined the effectiveness of various primary care fall prevention strategies, and a number of randomized controlled trials support multi-component intervention strategies in the ambulatory outpatient setting as being the most effective in reducing falls for community-dwelling older adults. Interventions with the strongest evidence of benefit, including medication review and modification, physical therapy for strength, balance, and gait training, home safety evaluation, and vitamin D supplementation, [19–22] were thus included as recommendations in our tool.

To assess the feasibility of using AHS' falls risk assessment tool within a clinic setting, on-site bilingual,

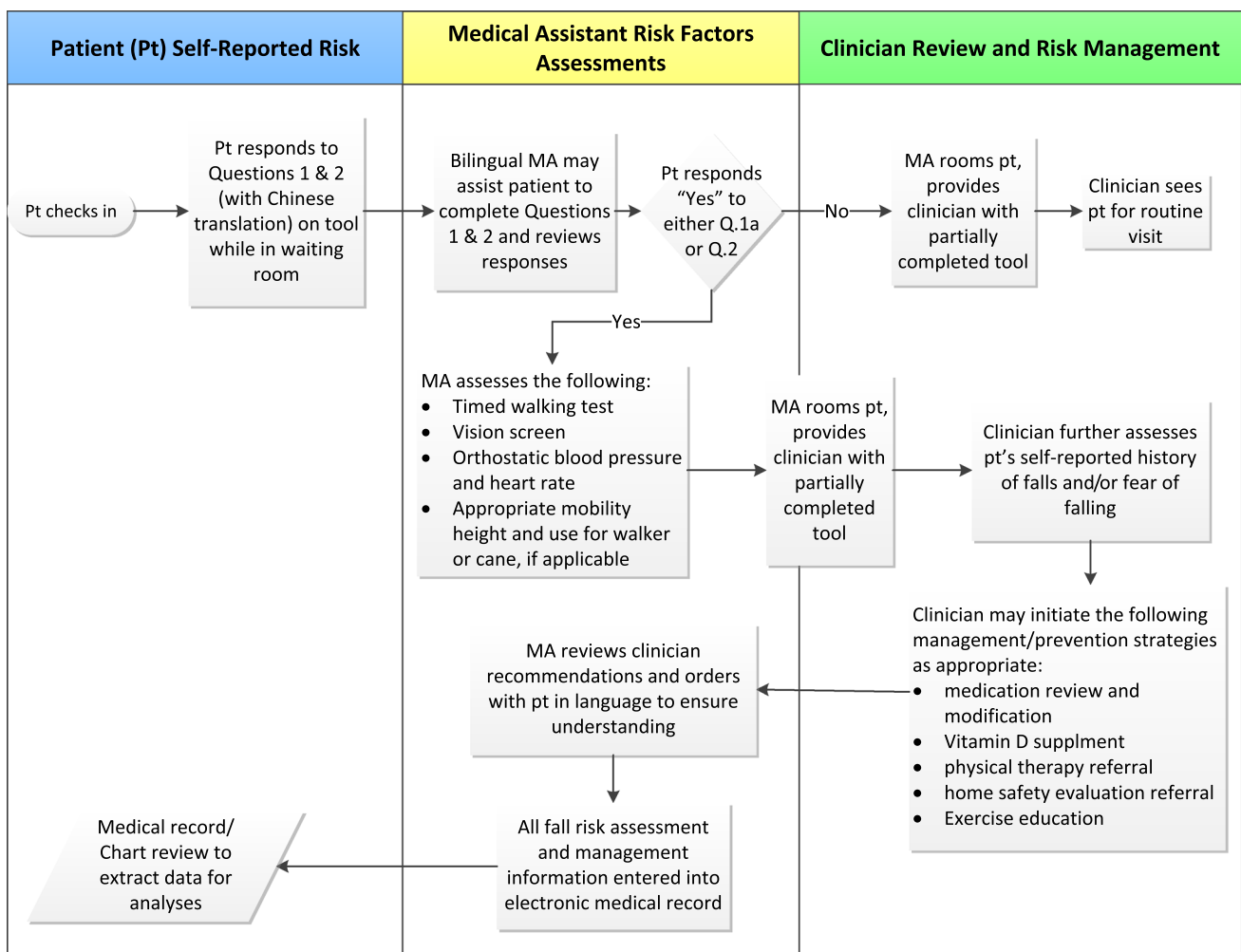
multidisciplinary, primary care teams applied the tool first with 75 Chinese-speaking older adults aged 65–80 years. Emphasis during this initial phase was on achieving minimal disruption of clinic workflow and maintaining AHS’ culturally sensitive and linguistically competent services. Once the tool and procedures were consistently integrated into AHS’ clinical practice (see Fig. 1), we broadened the screenings and examined the risk and rate of falls in a prospective cohort of Chinese-speaking older adults at AHS.

**Sample Population**

Our full prospective cohort included 839 Chinese-speaking older adults aged 65–80 who returned for routine medical care appointments at AHS’ Geriatrics Center between June 1, 2014 and June 10, 2015. Of this total cohort, we were able to obtain emergency room (ER)/hospitalization utilization data on a subsample of 455, who were AHS’ Medicaid managed care members (54% of the total study cohort).

**Outcome Measures**

In this brief report, we examine several outcomes. The prevalence of falls in this AA older adult cohort was assessed as the number of self-reported falls within the past 12 months among the 839 patients who were screened for falls risk (see Table 1). The rate of patients’ self-reported falls risk was derived from patients’ positive responses to Question 1a and/or Question 2 on the risk assessment tool. For the rates of ER/hospitalization utilization, we obtained data on screened patients who were Medicaid managed care member from our Medicaid managed care consortium, Community Health Clinic Network (CHCN), on whether the patient subsequently went to an ER and/or were admitted for hospitalization. This information included only a subsample of our full study population (54%), as only approximately half of our patients were Medicaid managed care members at the time of the study. In addition, we examined the ER/hospitalization utilization for CHCN patients with



**Fig. 1** Asian Health Services’ geriatric clinic fall risk assessment and management process flow

**Table 1** Demographics and Conditions of Patients who had Self-Reported Fall Risks (Falling or Feared Falling)

	All patients (N=839)				Restricted to managed care (CHCN) patients (N=455)			
	All patients	Positive self-reported risks <sup>a</sup>	Fell	Feared falling	CHCN patients	Positive self-reported risks <sup>a</sup>	Fell	Feared falling
Patient No. n (%)	839 (100)	388 (46.2)	173 (20.6)	362 (43.1)	455 (100)	214 (47.0)	94 (20.7)	202 (44.4)
Age mean (range)	72.1 (54–91)	73.1 (63–82)	73.4 (54–86)	73.1 (54–91)	71.4 (54–91)	72.7 (54–91)	73.2 (54–85)	72.7 (54–91)
Female n (%)	468 (55.8)	253 (65.2)	124 (71.7)	234 (64.6)	244 (53.6)	133 (62.1)	68 (72.3)	123 (60.9)
Married n (%)	625 (74.5)	288 (74.2)	123 (71.1)	270 (74.6)	344 (75.6)	166 (77.6)	67 (71.3)	159 (78.8)
BMI mean (range)	24.8 (16.1–38.1)	25.0 (16.1–38.1)	25.2 (17.6–35.4)	24.9 (16.1–38.1)	24.8 (15.6–37.0)	25.0 (16.1–37.0)	25.2 (17.6–35.2)	25.0 (16.1–37.0)
Depression n (%)	201 (24.0)	130 (33.5)	64 (37.0)	121 (33.4)	109 (24.0)	76 (35.5)	41 (43.6)	71 (35.1)
Diabetes n (%)	304 (36.2)	151 (38.9)	62 (35.8)	141 (39.0)	156 (34.3)	82 (38.3)	34 (36.2)	80 (39.6)

<sup>a</sup>Self-reported a fall in the past 12 months and/or feared falling (i.e., responded positive to Question 1a or Question 2 on falls-risk assessment tool)

positive fall risk who received active falls risk management by their clinicians versus those who did not.

Our study was reviewed and approved by the University of California, San Francisco Committee on Human Research between June 14, 2013 and June 13, 2016.

### Data Analysis

We calculated standard descriptive statistics of patient demographic characteristics, such as age, gender, and comorbid conditions, as well as outcomes (e.g., patient self-reported falls and/or fear of falling (see Table 1)). The prevalence of falls was assessed as the number of self-reported falls within the past 12 months among the 839 patients who were screened for falls risk. We used chi-square tests to determine the statistical significance for differences between any two groups (e.g., ER/hospital utilization rates for positive vs. negative risk patients). The statistical significance level was set to 0.05. We used SAS 9.4 [23] for all statistical analysis.

### Results

There were 839 patients who were screened for fall risks during the study period, with a mean age of 72.1 years (range 54–91) (Table 1). Among these patients, 173 (20.6%) reported having fallen in the past year. Among

those who reported a fall, 124 (71.7%) were female. When asked about fear of falling, 362 patients in the cohort (43.1%) responded yes, including 234 (64.6%) female patients.

We were also able to obtain ER/hospital utilization data for 455 patients (54.3%) who were part of Medicaid managed care (CHCN) (Table 1). The proportion in this subset who fell ( $n=94$ , 20.7%) and the proportion who feared falling (44.4%) were similar to that of the total sample. The mean age, age range, and prevalence of falls in female patients were also similar to that of the full cohort.

Of those who were screened as having positive risk in the risk assessment tool ( $n=214$ , 47.0%), 31 (14.5%) had an ER or hospitalization episode compared to 15 (6.2%) of the 241 who did not self-report fall risks ( $p<0.05$ ) (data not shown).

### Discussion

There exists a paucity of published falls risk data on AA older adults in the U.S., including basic descriptive epidemiology on the prevalence of falls [20, 24, 25]. From prior studies on populations immigrating to western countries from Asia, the Chinese older adults appear to have a lower prevalence of falls than their white counterparts in the U.S., but their falls prevalence over time may mimic that of other non-Asian populations in their adoptive countries [24, 25].

In U.S. data, the CA Health Interview Survey (CHIS), the nation's largest state health survey and known for its disaggregated racial/ethnic population data, is suspected of under-representing the incidence of falls in AA older adults, especially Chinese American elderly whose reported fall rates (10.4% with 95%CI 0–21.5) were lower than all races' older adults of similar age (12.1% with 95%CI 10.6–13.5) [26]. The 2011 CHIS survey results for the Chinese American population aged 65–80 was further reported as “statistically unstable” due to small sample size of participants.

Findings from our study showed that the prevalence of falls among AHS' Chinese-speaking, older AA adults is approximately 20%, which is higher than what was reported from the 2011 CHIS survey for the Chinese American population aged 65–80. Our pilot study provides preliminary evidence of the utility of a multi-pronged falls assessment tool to identify Chinese adults at increased risk. A main difference between AHS' screening questions and those presented in the 2011 CHIS survey is that AHS asks about any falls within the past 12 months, whereas CHIS asked whether there was more than one fall in the past 12 months. Therefore the CHIS survey may have identified a smaller subgroup of repeat fallers amongst AA older adults. In addition, when we examined the translated Chinese version of the falls screening question in the 2011 CHIS survey instrument, we found linguistic issues with its translation. Furthermore, AHS as an FQHC serves a clinic-based sample compared to CHIS' general population sample. AHS' tool also inquires about falls with an in-person evaluation tool compared to the CHIS survey conducted over the telephone.

Based on our ER/hospital utilization data, we also found that those who screened positive for falls risk were more likely to have been hospitalized or have an ER visit than those who did not report fall risks. These results suggest that AHS' falls risk assessment tool may be able to identify patients who are at higher risk for ER/hospital utilization, either due to falls or other related conditions. However, we note that our ER/hospital utilization data does not specify whether the ER/hospital visit was falls-related. Our finding seems consistent, however, with other population studies

which have found that fall risk may predispose older adults to functional dependence and other geriatric syndromes [7, 27].

Our results suggest that there is a need to screen older AA adults in community health centers and other clinic-based settings and to identify those at greater risk for falls and subsequent ER/hospital utilization. By identifying these higher-risk patients, clinicians can take preventive steps (e.g., recommending vitamin D supplementation, exercise, physical therapy, medication adjustments, and home safety evaluation) to help avoid costly and potentially fatal falls. Although more research is needed to confirm our findings, these results provide important insights from a practice-based study and can inform future research in this area.

Furthermore, to provide effective health care to AA older adults, we must recognize the myriad of vulnerabilities beyond advanced age such as linguistic and socioeconomic barriers that can threaten the health of these communities. Health care providers for these older adults must possess not only core geriatric care skills but also cultural and linguistic competencies in order to effectively respond to the complex needs of these patients.

**Author Contributions** All four authors contributed to the data collection, data analysis, results interpretation, manuscript writing and review, and approved the final manuscript. Drs. S.H. and T.Q. conceptualized the study and design.

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#### Compliance with Ethical Standards

**Conflict of interest** The authors have no conflicts to disclose.

**Appendix**

為了讓醫護人員更了解你的健康狀況，請回答以下兩個問題並在你選擇的答案上打圈。

<b>1a.</b> 在過去十二個月內，您有否跌倒，絆倒，滑下，昏倒，或失去平衡？ <i>During the past 12 months, have you fallen, tripped over, slipped, fainted, or lost balance?</i>	有 (Yes)	沒有 (No)
<b>1b.</b> 如果您對以上問題的回答是‘有’，以下的事情有沒有發生？ <i>If you answered ‘yes’ to the question above, did any of these things happen?</i>		
<ul style="list-style-type: none"> <li>• 您有沒有去急診室？ <i>Did you go to the emergency room?</i></li> </ul>	有 (Yes)	沒有 (No)
<ul style="list-style-type: none"> <li>• 您有沒有住院？ <i>Were you hospitalized?</i></li> </ul>	有 (Yes)	沒有 (No)
<ul style="list-style-type: none"> <li>• 您有沒有去診所見醫生？ <i>Did you go see a doctor at a clinic?</i></li> </ul>	有 (Yes)	沒有 (No)
<b>2.</b> 你是否害怕會跌倒？ <i>Are you fearful of falling?</i>	是 (Yes)	不是 (No)
<b>TOTAL</b> If total is 0, room patient.		

**STAFF ONLY** 職員用

MA initial: \_\_\_\_\_

- 🍏 Checked: 1-pt cane    4-pt cane    Stationary walker    2-wl walker    4-wl walker
- 🍏 Gait Speed Test: ≤5 seconds \_\_\_\_\_ >5 seconds \_\_\_\_\_
- 🍏 Orthostatics: Lying BP: \_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_ P: \_\_\_\_\_ Standing BP: \_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_ P: \_\_\_\_\_
- 🍏 Snellen: OU: 20/\_\_\_\_ OS: 20/\_\_\_\_ OD: 20/\_\_\_\_\_

<b>MD ONLY:</b>	
Assessed fall history v15.88	
Medication adjustment	
Vitamin D supplementation	
<b>Referral to physical therapy</b>	
<b>Home Safety Evaluation</b>	
<b>Health Education materials given</b>	
<b>Community exercise resource given</b>	
Other:	

Provider signature: \_\_\_\_\_

Scan for EMR

AHS - Fall Prevention screening tool 6/24/14 - LI

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