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# The Relationship Between Community Dwelling Older Adult's Fall Risk and Beliefs of Risk for Falling in Northwest Arkansas and Bolgatanga, Ghana.

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The Relationship Between Community Dwelling Older Adult's Fall Risk  
and Beliefs of Risk for Falling in Northwest Arkansas and Bolgatanga, Ghana

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of the requirements for the degree of  
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## **Introduction**

Older adults worldwide live with physical and psychological changes associated with aging along with comorbidities. Though the presence of such conditions can be life threatening, research has found older adults are more likely to die as a result of falling. As the worldwide population of individuals over 65 rises, so will the possibility for injuries from falls. Much research has been published concerning fall risk protocols in developing countries, but minimal research surrounding protocols and practices for protecting against falls in underdeveloped countries has been published. An aging population raises concern of how to better prepare those in the community to prevent complications of falling. The purpose of this study is to evaluate the relationship between an individual's fall risk and the perceived belief of their risk for falling.

Older adults at the Senior Center in Fayetteville, Arkansas and villages in Bolgatanga, Ghana were assessed using the Stopping Elderly Accidents, Deaths & Injuries (STEADI) fall risk assessment tool created by the Center for Diseases Control and Prevention. The assessment was followed by a questionnaire focused on attitudes, beliefs, and barriers pertaining to their fall risk. The relationship between the actual fall risks to the individual's perceived risk was examined. Understanding a person's beliefs of fall susceptibility, fall severity, and barriers and facilitators to fall prevention can help health professionals tailor preventative and teaching strategies to reduce falls.

### **Relationship Between Older Adults Fall Risk and Beliefs for Risk of Falling**

The fear of falling is a burden that many older adults face every day. Falls are the leading cause of death and the third leading cause of complications associated with

chronic illnesses in adults over the age of 65 in the United States (Rosen, Macka, & Noonan, 2013; Scheffer, Schuurmans, Van Diik, Van, & De Rooij, 2008). There are approximately 20,000 deaths in older adults reported each year related to falls (Stevens & Phelan, 2013). The estimated population over 65 years of age was 43.1 million in 2012 in the US; this number is expected to almost double by 2050 to a projected 83.7 million (Ortman, Velkoff, & Hogan, 2014). Many older adults understand risk factors and preventive measures associated with falls, but minimize their susceptibility (Hughes et al., 2008). Fall related injuries lead to poor health outcomes in older adults, as well as increased health care consumption and cost, decreased mobility, loss of independence, and consequential long-term reduced quality of life (Hartholt et al., 2011; Stevens & Phelan, 2013). The purpose of this study is to assess the relationship between older adults' fall risks, and the beliefs about their risk for falling. Interventions can then be identified that will help to reduce reported falls in the future.

## **Review of Literature**

### **CDC STEADI Tool Kit and the Health Belief Model**

Fall risk assessments are conducted to identify risk factors that make an individual more susceptible to experience a fall. Evidence-based protocols include assessing intrinsic and extrinsic risk factors to prevent falls from occurring in the community (National Guidance Clearinghouse, 2012). If a patient is identified as a risk for falling in the acute setting, education of the patient and family caregivers is required to promote prevention of further falls once discharged (NGC, 2012). In recent years, healthcare facilities have increased their use of evidence-based fall risk

assessments, but fall risk assessment of community-dwelling older adults has been limited (Goodwin, Jones-Hughes, Thompson-Coon, Boddy, & Stein, 2011).

Stopping elderly accidents, deaths, and injuries (STEADI) is a fall risk assessment tool kit created by the Centers for Disease Control and Prevention's Injury Center (CDC) to provide health care professionals with resources to assess and address patient's fall risks (Stevens & Phelan, 2013). CDC researchers created STEADI after an analysis of the literature identified that community physicians could not adequately recognize fall and gait disorders or evaluate patients who reported recent falls (CDC, 2015). STEADI was created to identify modifiable risk factors using an evidence-based design based on *Wagner's Chronic Care Model* (Stevens & Phelan, 2013). A study conducted in 2011 at the Oregon Health and Science University evaluated implementation of the STEADI fall risk assessment into clinical practice. STEADI was integrated into the normal clinical flow using EPIC™ electronic health record, and a one hour training session was conducted to teach users the seriousness of falls and how to use the program (Casey, Parker, Winkler, Lambert, & Eckstrom, 2016). Results indicate STEADI tools were easily implemented and effective. The vision of the CDC to create a clinical setting that proactively identified and addressed fall risk in older adults was the driving force of the study (Casey, Parker, Winkler, Lambert, & Eckstrom, 2016). This STEADI initiative combined community-based referrals and clinic, provider, and patient-based components to identify and address fall risk. Authors also conclude that support is required to sustain the fall risk screening into clinical practice.

The Health Belief Model is a tool used to explain and predict a variety of health related behaviors (Glanz, Rimer, & Lewis, 2002) and has been used in the design of this study. The constructs of the model include perceived benefits and risks to action, risk susceptibility and severity, self-efficacy, and cues to action

(Jones et al., 2015). These perceptions are combined to influence health behaviors such as fall prevention. (Jones et al., 2015).

A person's perceived susceptibility focuses on their belief for the risk of contracting a certain illness or condition (Stretcher & Rosenstock, 1997). The perceived severity is the degree to which someone is threatened by the illness. An individual's course of action depends on how effective they believe the benefits will be to reduce the threat, while perceived barriers are the negative aspects of agreeing to the recommended behavior (Stretcher & Rosenstock, 1997). Cues that trigger certain behaviors are also discussed. Self-efficacy is defined as an individual perception that a change in behavior will lead to the desired outcome (Stretcher & Rosenstock, 1997). All of these constructs were used to guide interventions for this study.

### **Factors for Falling**

Falls are often associated with underlying biological and psychological risk factors that have increased that individual's likelihood to fall. Biological factors include muscle weakness, impaired gait, slower reflexes, and foot problems (CDC, 2015; National Institute on Aging, 2017). Psychological factors include sensory deficits, confusion, and medication adverse effects (National Institute on Aging, 2017). Individuals that experience chronic illnesses, along with functional impairments, are at increased risk for falls (Nicklett, Taylor, 2014).

The CDC and Control and the U.S. Consumer Product Safety Commission utilized data from the 2001–2008 National Electronic Injury Surveillance System-All Injury Program (NEISS-AIP) to find that annually 37,991 emergency department visits are the result of falls due to throw rugs and carpets in the home environment (Rosen,

Macka, Noonan, 2013). Hazards that are assessed in the home are commonly categorized per room. Hazards include but are not limited to lack of railings, lighting and grab bars, uneven steps, lack of lighting, unstable flooring, throw rugs, electrical cords, high cabinets, slippery floors, pets, and height of the bed and toilet (HSSAT).

### **Demographics of Falling**

Research on falls in African countries is sparse. Apart from South Africa, no African countries provide information for managing and preventing falls in the elderly (Kalula, 2011). A study conducted on 105 subjects in three suburbs of South Africa found that increased falls were strongly linked to environmental factors (Kalula, Ferreira, Swingler, Badri, 2016). Poorly maintained external environments, small-overcrowded dwellings, poorly maintained public buildings, and nonexistent street lighting contributed to causing falls (Kalula, Ferreira, Swingler, Badri, 2016).

There is very little data describing fall rates in many regions of the world. There is no real “epidemiological data available for Africa, South Asia and the WHO Eastern Mediterranean region” (Yoshida, 2009). The CDC generates data every year discussing the number of falls for older adults for the United States, and there is yearly data for other developed countries surrounding the populations past yearly falls. The proportion of falls varies depending on the country and target population being studied, and many populations in the world do not have any data concerning their fall risk.

Though there is not data for all countries in regards to falling, there is a clear racial difference in fatal fall rates. Falls “increase with age for both genders and among different races,” and it was found that “white men have highest fatal fall rates followed by white women, black men, and black women. (Yoshida, 2009). The Health and Retirement Study is a population-based study that analyzes older adults progress through

the 1990s and early 2000s (Nicklett, Taylor, 2014). A study based on data collected from 2000-2010 HRS found that African Americans are less likely to experience recurrent falls in comparison to non-Hispanic whites (Nicklett, Taylor, 2014).

Regardless of country of origin, gender, or race, falls in the older adult population are increasing each year, and will continue to rise with the global increase in the population of adults over the age of 65 in the coming years.

### **Stigma surrounding Falling**

Many older adults are unaware of the term 'falls prevention' and are therefore unaware of the falls prevention interventions that can be life saving (Bunn, Dickinson, Barnett-Page, McInnes, & Horton, 2008). Negative perceptions, including social embarrassment, indignity, and damage to confidence, cause many over 65 to refute the idea that they are susceptible to falls and therefore do not need to work to prevent their occurrence (Hughes et al., 2008).

Members of sheltered accommodation communities stated falls prevention information was common sense, and not applicable to their everyday lives (Hughes et al., 2008). Another study conducted in 2001 on an older adult population in Sydney, Australia found a barrier to making home modifications to prevent falls is that individuals do not believe they will reduce their risk (Cumming et al., 2001).

The fear of falling is prevalent in older adults, yet many do not adhere to safety measures because they deny the need for implementation (Cumming, et al., 2001; Hughes, et al., 2008; Yardely, Donovan-Hall, Francis, & Todd, 2006). When confronted about the need to adhere to safety measures, some felt stigmatized that they were being asked to use a cane, walker, and grab-bars (Bunn, et al., 2008;

Cumming, et al., 2001). Many older adults do not perceive a correlation between their fall risk and falling (Hartholt, et al., 2011; Hughes, et al., 2008; Bunn, Dickinson, Barnett-Page, McInnes, Horton, 2008).

Because of this attitude, conducting fall risk assessments and interventions along with strategies for behavior change are necessary to provide the older adult population with awareness of hazards within the community that make them susceptible to falls.

### **Research Question**

What are older adult's beliefs about their risk for falling and how do they relate to assessed fall risk?

### **Methods**

This study was conducted following approval by the Institutional Review Board of the University of Arkansas. Written informed consent was obtained from each participant.

### **Research Design**

A mixed method approach was used to examine older adult's health beliefs about fall risk. Semi-structured interviews based on constructs of the Health Belief Model were used to collect data. Risk factors for falls were determined using the Center for Disease Control STEADI fall risk assessment tool.

### **Instruments**

The STEADI fall risk assessment tool consists of screening questions, a strength and gait assessments, vision test, and measurement of vital signs. Questions

are asked to determine: falls history, medical conditions that may increase risk of falling, and medications.

The Timed Up and Go (TUG) Test was used to assess functional ability. The TUG test measures the older adult's ability to stand up from a chair with an arm rest, walk 10 feet or 3 meters at normal pace, turn, and walk back at normal pace and sit down. According to the STEADI guidelines, an older adult who takes  $\geq 12$  seconds to complete the TUG is at risk for falling.

The 30 second chair stand was used to test leg strength and endurance. The older adult was asked to sit in the middle of the chair with arms against chest and rise to a full standing position and then sit back down. This was repeated for 30 seconds. According to STEADI guidelines, the below average cut scores for adults in the age group 70-74 is  $<12$  for men and  $<10$  for women.

For this study, an additional portion to measure strength was added. Each participant did a 5-time sit to stand test. This consisted of assessing how long it took the participant to stand up and sit down 5 times. This time was then recorded in seconds. The 5-time sit to stand test was compared to the 30-Second Chair Stand Test.

Balance was last assessed by asking the participants to stand in four different positions. First the participant would stand normally with feet slightly apart. For the second position one foot was moved slightly in front of the other, and the third position was one foot all the way in front of the other. The last position the participant was asked to do was stand on one foot. Each position was required to be held for 10 seconds. If the participant was not able to hold all four positions for 10

seconds then they did not pass this portion of the test.

Vision was tested using a Tumbling "E" Eye Chart. The eye chart was held 14" from the participants face to simulate the correct distance to measure eye acuity. The participant was then asked to point in the direction that the lines of the "E" were facing. If it was determined that the participant had not had an eye exam in the past year, then visual acuity was identified as a factor in falling.

Postural hypotension was measured while the patient was sitting and then standing. The two blood pressures were compared to determine if orthostatic hypotension could be a factor that would increase risk for falling.

The semi-structured interviews were recorded and consisted of questions from the 6 constructs of the health belief model: severity, susceptibility, self-efficacy, benefit, barriers, and cue to action.

### **Sample**

The relationship between self-perceived risk of falls and risk factors for falls was examined using a purposive, convenience sample of older adults in Northwest Arkansas and Ghana, Africa. In total, 35 participants were included in the sample and participated in the study from June 2017-August 2017. The sample selection was limited to adults over the age of 55. Participants included from Northwest Arkansas were members of the Fayetteville Senior Center. The participants utilized from Bolgatanga, Ghana were members of the local Zaare village.

Data collection techniques include individual interviews, field notes, and findings from the falls risk assessment. Demographical data consisting of age, sex, and ethnicity were recorded.

Descriptive statistics were used to obtain simple frequencies and calculate the percentage of older adults within different subgroups.

The one way ANOVA was used for analysis of continuous variables, using IBM SPSS24.

## Results

Table 1. Descriptive Statistics and Comparison of Means

	N	%	TUG Test mean score (SD)	P value ( 95% CI)	30 <sup>0</sup> chair stand mean (SD)	P value ( 95% CI)
All older adults <i>Mean Age 72</i>	35	100	19.14 (9.577)		9.97 (3.07)	
<i>Gender</i>						
Female	25	71.4	18.20		10.08 (3.13)	
Male	8	22.9	15.13	.078 (-6.5 - .36)	9.97 (3.18)	.874 (-2.81-2.40)
<i>Country</i>						
Ghana <i>Mean age 69</i>	24	72.7	18.83 (4.1)		9.76 (3.11)	
NWA <i>Mean age 75</i>	9	25.7	13.78 (2.05)	.001 (-8 - -2.1)	10.55 (3.04)	.513 (-1.66 – 3.25)
<i>History of Falling</i>						
Fell past year	10	28.6	16.7		10.22 (3.41)	
Did not fall	23	65.7	19.2	.125 (-5.75-.74)	9.6 (2.32)	.617 (-1.80 -3.03)

The box plot diagram was created and used to identify outliers and discard them from the data series before making further observation. Cases 1 and 29 were excluded from the observations. See Table 1. For descriptive statistics and comparisons of means. The only significant difference in results of the STEADI tests between the residents of NWA and Ghana was in the timed up and go.

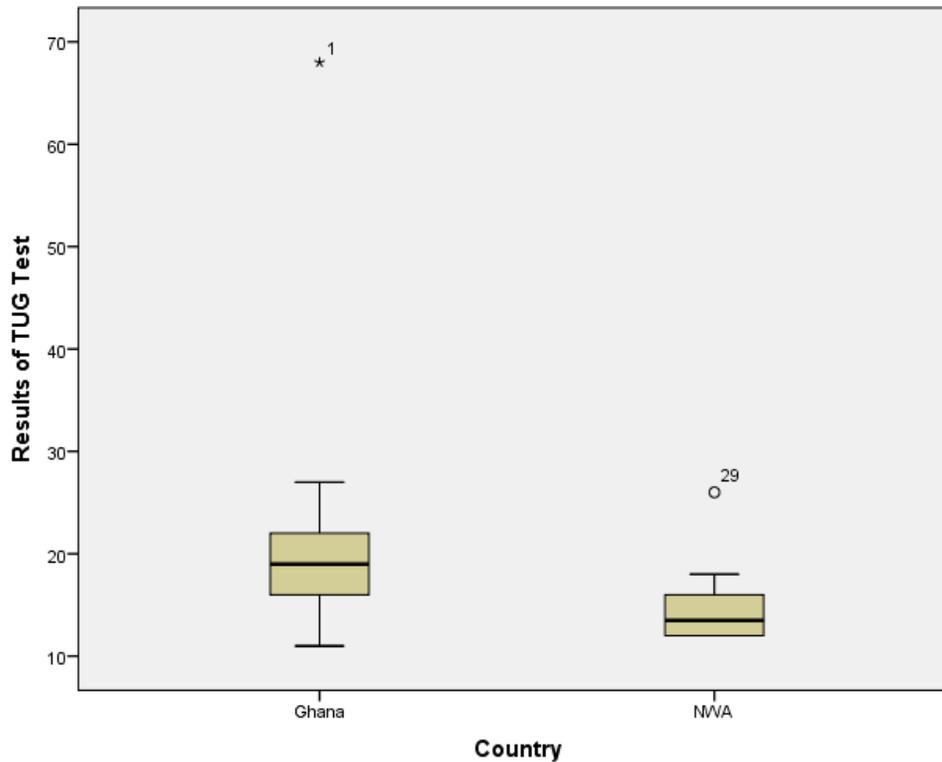


Figure 1. Box Plots of TUG results

Qualitative Results

Analysis of the semi-structured interviews (N=20) revealed four main themes:

participants didn't feel that they would fall, falling is not good, prevention of falls is hard, and falling is out of our control. The following table summarizes and compares responses made by participants from NWA and Ghana.

Theme	NWA	Ghana
<b>I won't fall</b>	I suppose, I just don't intend to fall if I can keep from it (Case 30). I see I'm coming up to something I'm going to look down. I don't want to fall over cracks in the ground or on the highway. I'm going to look down (Case 27). I would say 1 out of 100 I will fall. Most times when I'm walking I'm careful already so I would say one out of 100 (Case 27).	She hasn't tried anything that would prevent her from falling (Case 1). Very confident because she is a strong woman (Case 4). She says she is very confident that she wouldn't fall although sometimes she says she tries to get up and then she gets some sort of dizziness sometimes so when that happens she tries to maintain her position, other than that she is very sure she wouldn't fall (Case 5). She thinks her chance of falling is very low (Case 1).
<b>Falling is not good</b>	She says her kids and others around her would be worried because when she falls and get injured they would have to take her to the	The people around her would worry when she falls down (Case 4). If kids around they will have burden to take care of her then. Because of old age if she falls she could have

	hospital (Case 25). Probably would be a disaster, it would be harder on others (Case 34). Well at this age with osteopenia and osteoporosis I would break something (Case 28).	a broken bone. (Case 6). Benefits she talks of is when she clears the path the risk of injury is very low and the risk of falling is low so she doesn't really get injured because there's no stuff there that would injure her, and that brings safety to her children that play around and they would not get injured due to the obstacles in the way (Case 25).
<b>Preventing falling is hard</b>	If it's in the evening I don't keep enough lights on or something like that, and not paying attention, or getting in a crowd (Case 34).	The barriers are the local building and how it is. If we go this way you see how they build a short wall those barriers are what she finds difficult in getting across she takes caution (Case 5). Barriers are is maybe the bicycle that he uses sometimes so he tries to be careful bc that could also mess him up (Case 7).
<b>Falling is out of my control</b>	Not noticing something down low, or something sticking out, your knees are below otherwise you are generally watching (Case 30). Walking in fields where I don't know if there are holes around (Case 28).	His knee and the feet that he complains a lot that he can't walk and sometimes he loses his balance (Case 7). She says that her feet hurt a lot and that might make her fall (Case 9). Maybe when you walk and obstacles or when the floor is slippery, she can slip then fall down (Case 4).

Table 1. Summary of responses concerning participants perceived fall risk in NWA and Ghana

## 1. I Won't Fall

The majority of the participants interviewed stated that they did not think they had a risk of falling. Of the total 35 participants 13 reported that they have fallen in the past year. Participants were asked if they had tried things to prevent falling in the past and how confident they were that they wouldn't fall.

### 1.1 Ideas to Prevent Falls

In both Ghana and Northwest, Arkansas, there was a lack of knowledge by the general population of what to do to prevent falling and if anything has been tried in the past or present to prevent falling. When asked about falling people, older adults fell into two categories based on their answers, those that have tried strategies and those that hadn't. Over half of the participants stated "I haven't really tried anything" (Case 7). A few participants stated that you could "clear your path" (Case 5) and be cautious when walking around by "looking down at the ground" (Case 27).

*I've taken balance classes. I haven't taken any in a long time, but I used to take a lot*

*of classes that helped me (Case 34).*

## **1.2 Confidence to Prevent Falling**

When asked about the confidence level to prevent falling, there were mixed reactions ranging from laughing, being concerned, to being serious. A total of 12 participants stated they feel confident they could prevent falling. In general, more were confident despite assessment findings showing the high fall risk. Some participants brushed the question off stating “Oh yea, I’m confident” (Case 33), while others showed concern as “she is not confident that all those things could prevent her from falling” (Case 9). A few participants were confident that falling could be prevented by simply paying attention.

*It’s just paying attention, that’s about as confident as you can get because if you’re not paying attention you will mess up. But I look very carefully. When you’re pride gets involve in you activities you can mess up big time. (Case 30)*

## **2. Falling is Not Good**

Falling not only affects an individual, it also affects the family and caregivers emotionally as well as physically. Stress is placed on the individual that fell, the caregiver and patient relationship, and the caregiver’s personal emotional state. Knowing how to prevent falling will not only benefit the safety of older adults, but will ease the burden so many caregivers face when helping their loved ones.

### **2.1 Effects of Falling on the Individual**

It is common for older adults to suffer an injury secondary to the primary fall. “She thinks what might happen if she fell is her should will have a dislocation again. She has already experienced this once.” (Case 5). “She says when she falls is that she is very old

and she is afraid that there might be some kind of fracture when she falls down.” (Case 10). Older adults have a decrease in bone density due to the pathophysiological effects of aging, placing people at an increased risk of injury due to “osteopenia and osteoporosis.” (Case 28). Two participants stated that they don’t know what could happen if they fell, while two others didn’t seem to recognize the possible severity that a fall could have on their physical well being. Overall, 14 participants recognized the possibility of a physical injury.

*“Well I don’t know what could happen it depends, the main this is not to hit your head.” (Case 26).*

*“Well I would hope if I fell I would just get up pretty quick.” (Case 35)*

## **2.2 Effects of Falling on the Family and Caregivers**

Participants realized the emotional effects that falling would have on the caregiver. The increase in workload on the caregiver was the main concern. Half of the participants stated that their family “would be worried,” (Case 4) and they recognized family “will have a burden to take care of them” (Case 6). For some living in Northwest Arkansas, they stated the possible need to “go to the hospital if needed and they would take care” (Case 26) of any injuries. For a family member with a loved one in the hospital, this causes increased stress.

*“She thinks that maybe the kids will be worried because any problem the kids are to take care of her.” (Case 5)*

*“Her kids and others around her would be worried because when she falls and gets injured they would have to take her to the hospital.” (Case 25)*

Two participants brought forth a very important reality for many older adults:

hundreds of older adults live alone due to being widowed. They stated that, because of living alone, falling “probably wouldn’t change anything” (Case 27).

### **2.3 Effects of Falling on Friends**

Some older adults included in this study were not only thinking of the effects that falling would have on their own lives, but on the lives of friends that they were responsible for helping.

*“I do help an amputee out in town. It would probably affect me being able to help them sometimes.” (Case 32).*

## **3. Preventing Falling is Hard**

Preventative measures and health promotion are proven effective in decreasing the possibility of falling, but often older adults believe they have a low fall risk. The belief of a low fall risk along with uncontrollable environmental fall risk factors makes falling difficult to prevent.

### **3.1 What are my Chances of Falling?**

When asked about the chances of falling only one individual admitted they were at a high chance of falling, stating “without my husband I would fall a lot” (Case 29). In total, eight participants admitted they had a low fall risk either because they had not fallen, or because they were cautious. One lady stated she had a balance test conducted a couple of years ago and it said her chance of falling was “40%, which was higher than what I thought it was going to be” (Case 34). Six participants out of 20 felt they were unsure of their chances of falling, and one participant stated “well that you just don’t ever know” (Case 35).

*“I can’t prognosis that at all because you loose your balance and a lot of things*

*could happen.” (Case 30).*

### **3.2 Prevention Techniques**

Clearing the path, removing rugs, stairs, and having non-slippery shoes are prevention strategies used to decrease the risk of falling. “She tries to put on shoes that are very flat that are not slippery” (Case 5). Multiple participants reported watching for “rugs or anything like that” (Case 34) which might cause them to fall down. One participant stated that she “keeps a light in the bathroom at night...in the shower I’ve got a rubber mat so my feet don’t slip” (Case 35).

Doing some “balance exercises” (Case 27) was found to be helpful for one participant in increasing balance that could prevent her from falling. For those in Africa having a clear path to walk on would greatly reduce the risk of falling. “There are paths, obstacles, or maybe rocks or stones on the way and what she could do is prevent those paths that she goes through” (Case 4) or maybe “move the obstacles in the way” (Case 7).

Of the 20 participants included 7 of them stated they did not know any prevention strategies that would keep them from falling.

*“She has no idea the things that could prevent her from falling.” (Case 8)*

*“No, but I’m not to that point right now.” (Case 33)*

### **3.3 There are Barriers for Prevention**

The biggest barriers discussed to prevent falling were the layout of homes and buildings, physical outside environment, and a lack of lighting to see where one was walking. In Africa, the biggest barrier to preventing falling was the layout of the compound where participants lived. In the compound, the floor is “not cemented so

there are potholes” (Case 8). In Ghana, leading into many of the buildings there was a small ledge that participants had to step over to enter the room. One participant stated “those barriers are what she finds difficult in getting around, she takes caution” (Case 5).

The physical environment of being outside with stones, walking in tall grass, and cracks in the ground make people more likely to fall. “Stones on the ground” (Case 6) and “weeds that on the path were water is fetched” (Case 25) were barriers created by the physical environment in Ghana.

*“Somebody else trying to get your attention to try to hurry you, or try to get you that’s what causes a lot of problems.” (Case 30)*

Two participants stated there were no barriers to preventing them from falling at the time of the interview.

#### **4. Falling is Out of my Control**

Many participants believed that falling was out of their control because of barriers, not knowing presentation strategies, and not knowing if they were or weren’t at risk for falling.

##### **4.1 Perceived Causes of Falling**

Over half of the participants in this study reported that their cause of falling would be from an obstacle in their path. Some participants also admitted that they are not very careful in watching their path and that might be why they end up falling down.

Obstacles that are “down low or something sticking out below your knees” (Case 30) could be the cause of someone falling down. Another cause of falling is “not looking where I am going and little cracks in the street” makes someone fall down. A participant admitted that they sometimes move too quickly and said when “walking very fast you are

likely to go down” (Case 35).

A few participants that were interviewed discussed the physical problems that were the causes of their falls in the past.

*“His knee and the feet he complains a lot about, he can’t walk and sometimes loses his balance.” (Case 7)*

## **5. Benefits to knowing prevention strategies**

Majority of participants stated the only benefit to implementing fall prevention strategies was not falling, but did not state any other benefit. Three people stated they did not know any benefits for implementing prevention strategies simply because they “didn’t know what to do to prevent falling” (Case 2).

## **Discussion**

After conducting statistical analysis on the CDC STEADI fall risk assessment, the only data that showed a significant difference was the Timed Up and Go Test (TUG) test. This test was found to take longer (18.83) for participants in Ghana compared to participants in Northwest Arkansas (13.78). Suspected reasoning for this difference are environmental factors along with observed health of the participants. Those individuals from Northwest Arkansas were active older adults at a senior center. Individuals from Ghana were all types of members out in the community, rather than just a perceived active group like in Northwest Arkansas. Normal gait was also not observed prior to this test, therefore it was not observed if participants were walking faster or slower during the TUG test.

The box plot diagram was created and used to identify outliers and discard them from the data series before making further observation. Cases 1 and 29 were excluded

from the observations. See Table 1. For descriptive statistics and comparisons of means.

### **The only significant difference in results of the STEADI**

Overall when asked about their perceived chance of falling, participants stated they had a low risk. According to the results of the STEADI assessment, only 1 out of 35 participants actually passed the fall risk assessment. Many people do not know the prevention strategies that can prevent themselves from falling. There is a lack of knowledge about falling, therefore individuals were confident that they could prevent falling despite results showing their high fall risk. Confidence was high in study participants that they could prevent falling, but finding was not supported by the quantitative data. More people were confident in Northwest Arkansas that they could prevent falls compared to Ghana.

Participants were more aware about the effects of falling on their physical health. Many stated they realized they had more brittle bones, and a fall would likely mean they would break or dislocate something. There was also a realization by half of the participants of how this would negatively effect the family. In Africa, older adults rely specifically on their loved ones to care for them in the villages. There are no nursing homes or assisted living. Many participants in Ghana realized this would cause an increased burden to their family members, requiring them to care for them even more in addition to their normal duties. Responses from Northwest Arkansas had a reoccurring theme that they would end up in the hospital when they fell, and didn't elaborate as much on how it would specifically impact family members. A few participants in Northwest Arkansas stated they lived alone, therefore it wouldn't impact anyone. In Ghana, most family members live together in what is called a family house, so they will not be alone.

This was a big difference between the two populations.

When asked to specifically describe things that could prevent falling, there was a large difference between the responses of those from Northwest Arkansas and Ghana. Many in Ghana have to walk outside to fetch water and wood, and they prepare food outside as well. This population does not spend the day inside as is common in the United States. Participants identified strategies that could prevent falling such as moving stones and rocks out of the pathway. In Northwest Arkansas, responses were removing rugs, installing side rails, watching going up stairs, and wearing non-slippery footwear. The difference in the responses is due to cultural and environmental factors.

Barriers to prevent falling also varied between the populations included in the study. Those in Ghana identify barriers due to environmental factors such as their being stones they can't move, or weeds and potholes in the ground. Fall risks in Ghana were conducted outdoors; therefore, some of these barriers were experienced first hand. Another point made by those in Ghana is the building structure that people live in. The buildings are not cemented and are made out of dirt and clay. Because of wear and tear of time, potholes develop in the houses people live in. Those from Northwest Arkansas were more likely to say that there is no barrier that would prevent them from putting prevention strategies into place.

Overall, only one individual admitted they were at a high risk of falling, compared to 8 that stated they had a low chance of falling. More people in Northwest Arkansas reported they had a low chance of falling than those in Africa. This could be due to increased education surrounding falling and ways to prevent falling present in Northwest Arkansas. Still, over 25% of respondents reported they didn't know their

chance of falling, and stated falling was more due to chance and was not in their control.

Results of this study indicate that there is a gap in knowledge of the benefits of prevention strategies. Participants that were aware of prevention strategies knew that their main and most important benefit would be that they did not fall down. No one mentioned the benefit of not going to the hospital. There was also no connection made between how preventing falling would prevent costs to the individual.

### **Limitations**

A language barrier was faced in Ghana, Africa. Local Ghanaian interpreters participated in data collection after testing validity and reliability of information translated from English to Fare Fare, the local language spoken. Two interpreters were utilized to collect data to insure the most consistent results would be obtained.

Mr. John Agana, member of the Bolgatanga, Ghana community, and resident of Northwest Arkansas, first translated all information presented to subjects in Ghana. After translation of materials, it was translated back into English to assess the accuracy of the translation. Material was tested for reading level using Flesch-Kincaid Grade level as a 3rd grade literacy level.

Translators are associated with the Bolgatanga, Girls High School. The translators are fluent in English, and were asked to restate information upon first interaction to check for validity of information to be shared. All information was first translated to Fra Fra and then spoken back in English and recorded using a recorder.

Not all participants were able to be utilized in the qualitative analysis of data. The 15 participants not included did not have a complete interview recorded, and

therefore their perceived fall risk could not be analyzed and included in the final qualitative data set.

This study aimed to include participants over the age of 55. In Bolgatanga, Ghana, we were faced with individuals that did not know their specific age, but were reported to be over the age of 55 years. Participants who did not know their exact age were included in this study. Because specific ages were not known for everyone, it is possible that a participant would have been younger than 55.

### **Conclusion**

The global older adult population has grown substantially in recent years and is expected to continue to increase in coming decades. By 2050, the global population of adults over the age of 60 is expected to reach nearly 2.1 billion, with two thirds residing in developing countries, and numbers rising faster than in developed countries (United Nations, 2015). Lack of awareness of fall risk can lead to complications in health, and result in death. Results from this study indicate that many older adults believe they have a low chance of falling even when their risk is significantly higher. There is a great need for education surrounding prevention strategies to prevent falling. It was alarming that people were confident they weren't going to fall despite their high risk, but even more alarming that many did not know how they could even prevent the fall. Global awareness is needed about the seriousness of falls in this population and for prevention that will reduce injury, hospital admissions, and increased healthcare costs.

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