

“No More Falls Research Project Final Report”

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Abstract

Background: In Henderson County approximately 21.5 percent of the population is age 65 and over. Falls are a significant problem for older adults, with 1.6 million seniors being treated in emergency rooms across the nation for fall-related injuries. Individuals who have sustained a fall are at risk for further falls; however, falls are not an unavoidable part of aging. The objectives of this research included exploring the beliefs, perceptions and fears of older adults related to falls, assessing interventions (education focused on risk factor management, physical therapy referrals, exercise program participation) that might help seniors avoid falls, and identifying obstacles to participation in fall prevention programs. Ultimately, with this information the researchers sought to learn how to structure a community-wide fall prevention program.

Methods: With the burgeoning demography of older adults in Henderson County, Western Carolina University and Pardee Hospital, through a grant provided by the North Carolina Center for Healthy Aging, conducted a fall prevention research project from October 2006 through April 2007. The project was approved by the Institutional Review Boards of Pardee Hospital and Western Carolina University. The study was comprised of educational sessions on fall prevention (see Appendix), fall risk screening with a modified version of the Timed Get Up & Go, the Animal Fluency Screen, a pre- and post-survey and focus group discussions on how falls could be prevented in Henderson County. Approximately 400 older adults attended some 13 community presentations, and of that group 184 gave informed consent for their data to be utilized in the research study. The presentations occurred at five community sites selected for economic diversity and age variation including Sammy Williams Center, Carolina Village, Edneyville Senior Center, Kenmure and Pardee Health Education Center. In addition, at Sammy Williams Center and Kenmure, focus group data was collected to further clarify how fall prevention programming taken to a community-wide level should best be structured. Data analysis was completed on SPSS version 13.0, and participant data was coded and analyzed using SPSS 13.0. By masking the data with a dummy code, the identity of the participants was protected. Basic frequencies, descriptive statistics and correlations were the primary mode of analysis. For the purposes of this research project, the researchers intentionally did not define “falls” for the participants. Rather, older adults were allowed to use their own perceptions regarding the definition of falls. All data in the pre- and post-survey was based on self report. With a strong emphasis in the study on determining attitudes toward falling and confidence about avoiding falls during daily activities, the researchers felt it was important to understand how seniors view their own risk of falling rather than influencing their attitudes by providing them a pre-determined definition.

Results: There were 184 participants who gave informed consent out of 400 older adults attending the education and assessment programs. Prior to the educational program, half of the participants viewed falling as a normal part of aging. On the post-survey, 10% fewer respondents felt the same. Confidence levels were assessed in various activities of daily living revealing that

older adults had the least confidence (49% post-test) in “going up and down stairs.” This was directly related to “fear of falling.” Obstacles to participation in falls prevention programs primarily included “cost,” “transportation” and “location” with those in the higher income category placing more emphasis on “scheduling.” Case management was found to be highly useful in ensuring that participants deemed at risk of falling received physician-ordered physical therapy evaluations and treatment. On pre- and post-survey analysis, respondents revealed a 25% increase in physical therapy participation levels on the post-survey after fall prevention education.

Conclusions: Older adults that responded to the survey reported that they did have a fear of falls; half felt that falls were a normal part of aging, and they were interested in reducing their risk of falls through programs, home safety evaluations and case management services. Barriers to participation that were identified included transportation, location, cost and scheduling. In addition to appropriate fall preventative services, intensive case management was effective in assisting respondents identified "at risk" for falls.

Section I. Beliefs, Perceptions, and Attitudes about Falling

Research nationally in the last decade has suggested that more than one third of adults over the age of sixty experience a fall each year (Hornbrook, 1994; Hausdorff, 2001). Falls have a devastating effect on older adults. In fact, in 2005 the Center for Disease control reported that more than 1.8 million seniors age 65 and older sought medical treatment related to falls (CDC 2005). Of those who fall, 20% to 30% will suffer moderate to severe injuries such as hip fractures or head traumas that reduce mobility and independence and increase the risk of premature death (Sterling 2001). Fall prevention research programs implemented in other communities have demonstrated improvements in life satisfaction and fall history reduction for participants (Cheal & Clemson 2001). The following information offers data analysis of questions from the pre- and post-survey and screenings for fall risk that address the specific aims.

Do You Believe Falling Is a Normal Part of Aging?

On the pre-survey, 50% of all participants felt falling was normal as one ages, but, interestingly, 50% did not feel falling was normal. In other words, there was a valid 50/50 split in answer to this question. On post-testing (after education sessions), the attitude that falls are normal as one ages shifted, and 10% of participants who initially responded “yes” to this question changed their views on falling. This has significant implications for their understanding of their own role and lifestyle choices in avoiding falls. We saw a significant change in attitude between the pre- and post-surveys that seems to be tied to our educational fall prevention program. The mean differences for the self-report measure are presented in Figures 1 and 2 below.

FIGURE 1

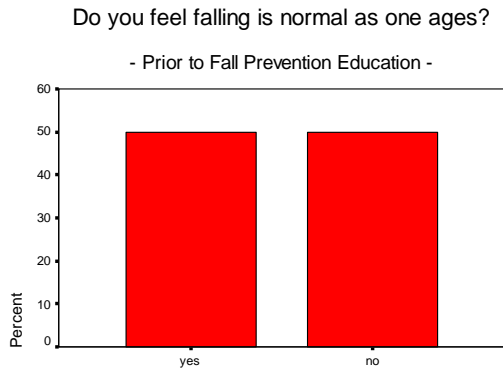
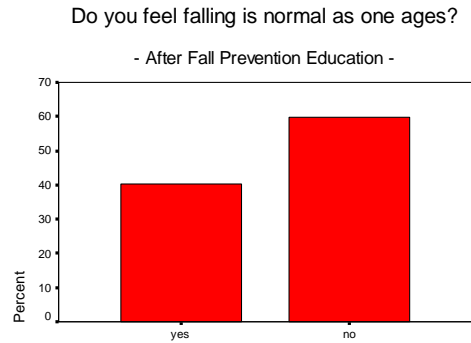


FIGURE 2



The table below demonstrates that on the pre-survey 50% of respondents viewed falling as normal, and 50% did not.

Pre-Test: Do you feel falling is normal as one ages?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	87	47.0	50.0	50.0
	No	87	47.0	50.0	100.0
	Total	174	94.1	100.0	
Missing	System	11	5.9		
Total		185	100.0		

With fall prevention education on post-survey, the chart below indicates there was a 10% reduction in the number of respondents who felt falling was a normal part of aging.

Post-Test: Do you feel falling is normal as one ages?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	48	25.9	40.3	40.3
	no	71	38.4	59.7	100.0
	Total	119	64.3	100.0	
Missing	System	66	35.7		
Total		185	100.0		

Carolina Village and Pardee Health Education Center had large percentages of the total number of participants—38.6% of the total at Carolina Village and 24.3% of the total at the Pardee Health Education Center. Of these participants, 100% of them responded to the question as to whether they viewed falling as a normal part of aging on the pre-survey. On the post-survey, the response rate was lower with 87.1% answering the question at Carolina Village and 70.5% answering it at the Pardee Health Education Center. At Carolina Village, 52% of respondents self-reported a belief that falling was a normal part of aging on the pre-survey, but that significantly declined on the post-survey (post-education) with only 39.3% believing it was normal. At the Pardee Education Center, 40.5% of respondents believed it was normal to fall as one ages on the pre-survey which declined to 32.1% on the post-survey. There were significant age differences between the two sites. Of the Carolina Village respondents, 84.2% were over the age of 85 years while only 36% of the Pardee Health Education Center respondents were over age 85. It would appear that as age increases, there may be a slight dispositional increase toward assuming that falling is a normal part of the aging process. The mean plots below displayed in figures 3 and 4 show the average mean differences for the pre-and post-surveys relative to the question of whether falling is a normal part of aging.

FIGURE 3

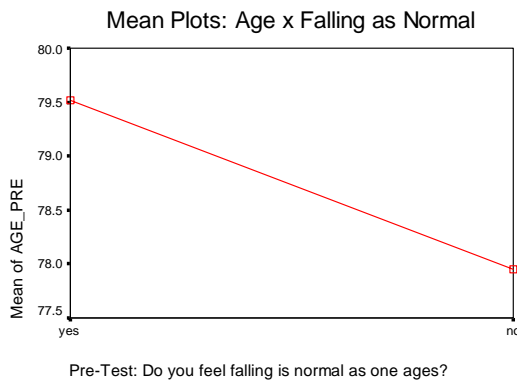
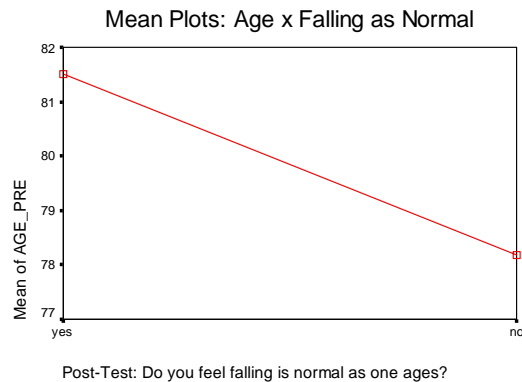


FIGURE 4



This finding could be due to the experience of falling and feelings related to lack of control, and/or it could be a function of our sample. It would be interesting to look at this again in another cohort. This shift may also have significant implications for those who structure fall prevention programming for differing age groups. For example, based on the above research findings, in future educational fall prevention programs, it may be wise to incorporate a more significant module geared at dispelling beliefs that falling is normal as one ages.

Does Education Affect Fear of Falling?

Determining whether or not education affects the fear of falling was an important part of the research intervention of this study because the literature and analysis of this research show that impacting aging adults' views on falling can have a positive impact on the likelihood of future falls. For example, Chamberlin, Fulwider, Sanders, and Medeiros (2005) report that fear of falling does influence spatial and temporal gait parameter changes in elderly persons. In their study of ninety-five community-dwelling adults aged 60-97 years, slower gait speed, shorter

stride length, increased stride width, and prolonged double limb support time were found to be associated with a preexisting fear of falling. (Chamberlin et al., 2005).

For this reason, this study sought to better understand the level of fear of falling in the participants in the study. Our hypothesis is that if older adults view falling as a normal consequence of aging, then this attitude may impact their fear of falling. Prior to the educational sessions, a valid 81% of respondents on the pre-survey self-reported that they had at least some fear of falling. According to the pre-survey, 58% were “somewhat” fearful of falling, 13% self reported fear of falling “often,” and 10% indicated they were afraid of falling “all the time.”

Pre-Test: Afraid of falling?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	not at all	34	18.4	18.8	18.8
	somewhat	105	56.8	58.0	76.8
	often	24	13.0		90.1
	all the time	18	9.7	9.9	100.0
	Total	181	97.8	100.0	
Missing	System	4	2.2		
	Total	185	100.0		

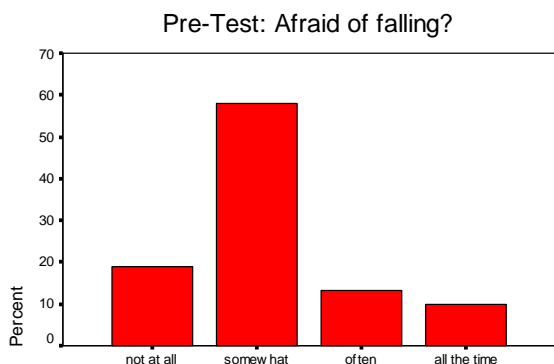
Comparing pre- and post-survey responses regarding respondents who were “not at all afraid of falling” revealed a 4% increase in those who reported that they were “not afraid of falling” (19% on pre-survey versus 23% on the post survey). So in essence, the fall prevention education program may have moved 4% of the sample into the “not at all afraid” category based on post surveys completed after fall prevention education. Additionally, 13% of the sample was “often afraid of falling” on pre-survey before education versus 8% on post-survey. In the category fearful “all the time,” there was a 1% increase in the number of respondents who self-reported a fear of falling “all the time” on post survey, which was not viewed as significant. These findings are consistent with previous research by Underwood, Parsons, Eldridge, Spencer and Feder (2006), who reported that asking older people about fear of falling did not have a negative affect.

Post-Test: Afraid of falling?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	not at all	32	17.3	23.4	23.4
	somewhat	79	42.7	57.7	81.0
	often	11	5.9	8.0	89.1
	all the time	15	8.1	10.9	100.0
	Total	137	74.1	100.0	
Missing	System	48	25.9		
	Total	185	100.0		

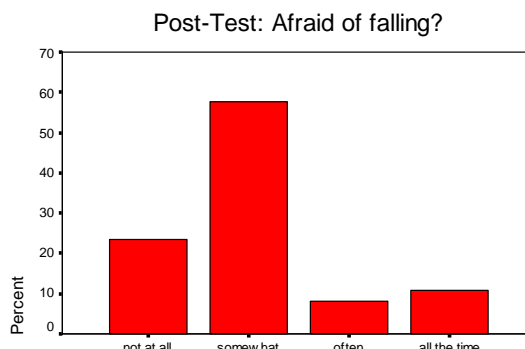
The bar graphs below (Figures 5 and 6) demonstrate the phenomenon of change prior to education on pre-survey and after education on post-survey in the various categories relative to the question, “Are you afraid of falling?”

FIGURE 5



Pre-Test: Afraid of falling?

FIGURE 6



Post-Test: Afraid of falling?

It would appear from the data and charts above that education on fall prevention may have had some impact on decreasing respondents' fears of falling in three categories.

Does Education on Fall Prevention Improve Confidence During Daily Activities?

In assessing the fear of falling and whether falling is a normal part of aging, the researchers felt that it was important to consider confidence levels of avoiding falls during activities of daily living and instrumental activities of daily living. Data was collected from respondents on pre- and post-surveys regarding perceptions related to confidence in avoiding falls while going about activities including getting up and down from a chair, getting dressed, reaching into cabinets or closets, shopping, walking in their neighborhood and cooking. There was no significant improvement in self-reported confidence level after education related to these activities. Data analysis in this area somewhat followed whether respondents felt falling was or was not a normal part of aging and whether there was a fear of falling. Ability to achieve daily activities without undue fear of falling, it was felt, could enhance life satisfaction and intervene in fall risk. In other research, Chamberlin, Fulwider, Sanders and Medeiros (2005) have shown that fear of falling is associated with decreased quality of life, depression, and increased frailty.

Confidence while bathing: Since many falls occur in the bathroom area, the researchers were interested in perceptions regarding confidence about avoiding falls while bathing. A valid 61% of respondents expressed a lack of confidence while bathing during the pre-survey completed before the fall prevention education program. (See chart below)

Pre-Test: Confident about bathing?					
Missing	System	4	2.2		
Total		185	100.0		
	somewhat	53	28.6	29.3	37.0
	Often	43	23.2	23.8	60.8
	all the time	71	38.4	39.2	100.0
	Total	181	97.8	100.0	

On post-survey following the fall prevention education program, the lack of confidence in avoiding falls while bathing decreased to 52% (an 11% increase in confidence). This increase in confidence on post-survey indicated a strong relationship between the fall prevention education program and confidence about avoiding falls during this activity of daily living. (See chart below)

Post-Test: Confident about bathing?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	not at all	10	5.4	7.3	7.3
	somewhat	31	16.8	22.6	29.9
	often	29	15.7	21.2	51.1
	all the time	67	36.2	48.9	100.0
	Total	137	74.1	100.0	
Missing	System	48	25.9		
Total		185	100.0		

Confidence while going up and down stairs: When asked about their confidence level while going up and down steps, 75% of respondents self-reported a lack of confidence on pre-survey (prior to the educational program). On post-survey, following education, confidence improved by 7%. The following charts demonstrate the frequency and valid percent.

Pre-Test: Confident going up and down stairs?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	not at all	23	12.4	12.8	12.8
	somewhat	68	36.8	38.0	50.8
	often	43	23.2	24.0	74.9
	all the time	45	24.3	25.1	100.0
	Total	179	96.8	100.0	
Missing	System	6	3.2		
Total		185	100.0		

Post-Test: Confident going up and down stairs.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	not at all	12	6.5	8.8	8.8
	somewhat	41	22.2	30.1	39.0
	often	39	21.1	28.7	67.6
	all the time	44	23.8	32.4	100.0
	Total	136	73.5	100.0	
Missing	System	49	26.5		
Total		185	100.0		

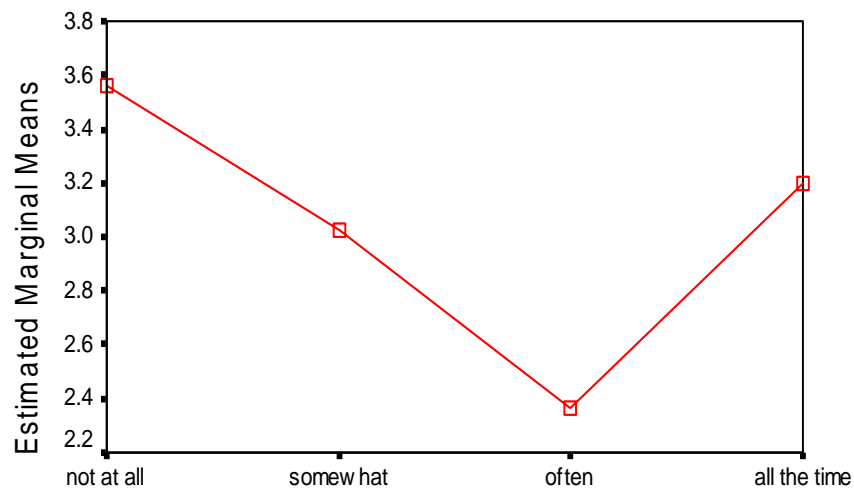
Confidence in avoiding falls while bathing and going up and down stairs relates to age:

On the post-test measure, confidence in going up and down stairs and bathing had a significant negative relationship with questions related to fear of falling. Statistically, there is a clear undeniable relationship between respondents' self-reported fear of falling and their confidence levels on these two activities. Figure 7 below illustrates this relationship.

FIGURE 7

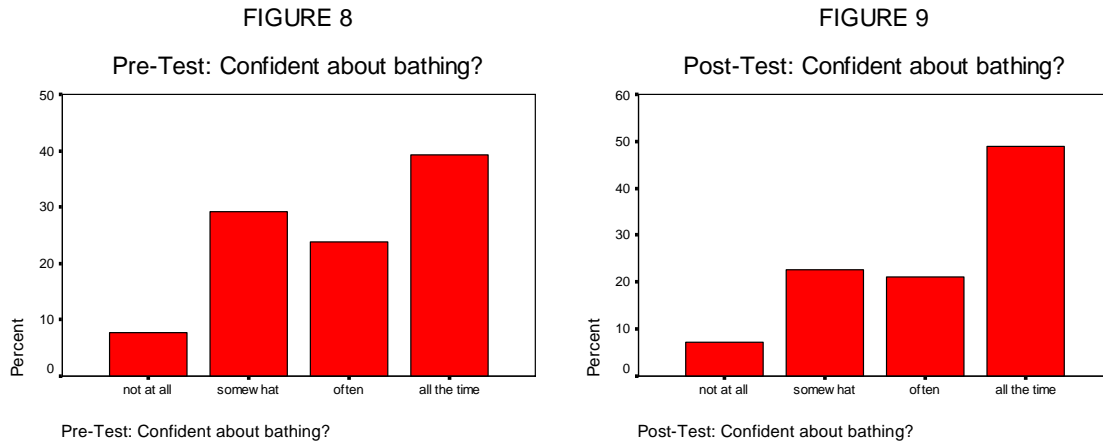
Afraid of Falling x Confidence in Bathing

- Post-Test -

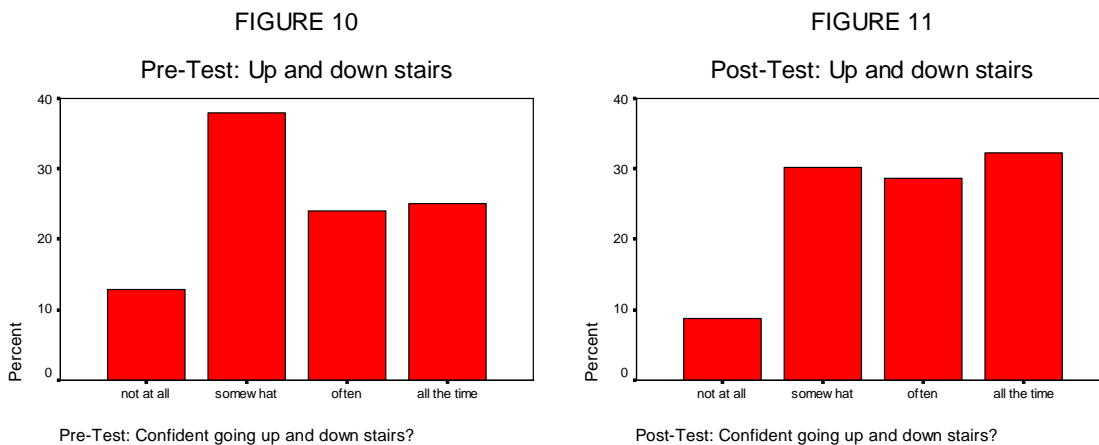


Post-Test: Afraid of falling?

The next two bar graphs demonstrate the improvements in confidence levels between pre-survey prior to fall prevention education and post-survey following the educational sessions related to confidence level of respondents while bathing (Figures 8 and 9).



Upon post-survey, following the fall prevention education session, the graph below demonstrates a reduction in lack of confidence in the “not at all,” “somewhat” and “often” confident in avoiding falls” categories while going up and down stairs. Figures 10 and 11 show the pre- and post- results from the self-report instrument.



Participants who were not afraid of falling showed significant confidence in their ability to avoid falls while bathing as opposed to those who declared that they are often afraid of falling. Clearly, there is a relationship between fear of falling and confidence level in being able to perform activities of daily living such as going up and down the stairs. On the other hand, housekeeping, preparing meals, reaching into cabinets, shopping and getting dressed and walking in their neighborhoods did not have a similar relationship to fear of falling. This might have programmatic intervention implications, or may just reflect that the participant does not associate the potential of falls related to these activities.

Do You Feel Falls are Significant Only if Injuries Occur?

Those on the pre-test who viewed falls as a problem only if they had an injury correlated with post-test respondents who felt falls were a normal part of aging. There were indications that the fall prevention education program may have impacted the knowledge of participants about the significance of falls, even though their attitudes about falling as a normal part of aging remained constant. The researchers recognize that education requires assimilation, but were reassured to see a positive change in attitude toward significance of injury in relationship to falls in those who continued to view falls as a normal part of aging on post-testing.

Do You Feel That You Know What to Do to Avoid Falls?

According to the survey, 42.2% of participants on pre-screen felt that they “often” or “all the time” knew how to avoid falls. After the education session on fall prevention, the post-survey indicated that 85.4% had such a confidence level. This was a significant increase in self-reported confidence and knowledge which suggested that the fall prevention education curriculum is imparting practical knowledge about fall avoidance. The table below demonstrated the percentages of confidence in avoiding falls on post-survey after education.

1-know what to do to avoid falls?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	somewhat	20	10.8	14.6	14.6
	often	71	38.4	51.8	66.4
	all the time	46	24.9	33.6	100.0
	Total	137	74.1	100.0	
Missing	System	48	25.9		
Total		185	100.0		

Did You Participate in Physical Therapy Prior to the “No More Falls” Program?

In response to this question, 52% of the respondents had previously participated in a physical therapy program and 48% had not. This was verified on the post test with minimal change in response. The sample on the post was smaller and likely represents a more committed group of individuals, hence a slightly higher physical therapy history.

Pre-Test: Physical therapy prior to falls program?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	88	47.6	51.8	51.8
	no	82	44.3	48.2	100.0
	Total	170	91.9	100.0	
Missing	System	15	8.1		
Total		185	100.0		

Since the "No More Falls" program, on post-survey a valid 25% of individuals said they had initiated a physical therapy program. This information was supported with reports from Pardee Rehab and Sports Therapy, which indicated referrals for physical therapy evaluation and treatment had increased by 10% as a result of participants screened in the "No More Falls Research Project." Additionally, Carolina Village reported that as a result of the program sixteen residents or 23% of participants in the research project were referred for evaluation and therapy following screening and educational sessions in the research program. Whether those referred are the same as those who indicated they had initiated physical therapy since the educational program and screening on the post-survey is unknown at this time. It is also possible that other physical therapy programs received referrals as a result of the "No More Falls" program. Clearly, the educational and screening program utilized during the "No More Falls" yielded a significant increase in participation in physical therapy since initiation of the project.

Post-Test: Since falls program did physical therapy

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	32	17.3	25.2	25.2
	no	95	51.4	74.8	100.0
	Total	127	68.6	100.0	
Missing	System	58	31.4		
Total		185	100.0		

Since the fall prevention program have you begun an exercise program?

Exercise participation on both pre- and post-testing was self-reported as constant by 80% of the respondents. The study merely asked participants whether they did or did not exercise prior to and since the falls program with no detail regarding frequency or duration of exercise. It is possible that answers could have been affected on pre-survey by social pressure. Reports from Carolina Village and Pardee are not yet available for wellness participation. Regardless, a large majority (80%) of respondents on post survey report that they do exercise.

Who is at risk of falls?

Participants found to be at risk of falling were determined by reviewing both objective data from the "Get Up and Go Screening" and "Animal Fluency Screen" and their self-reported responses on the fall risk survey. As data was received, an informal initial weighting scale enabled the researchers to determine how significant risk of falling was from pre- and post-survey. Surveys were reviewed for the following risk factors: fear of falling, lack of confidence in performing daily activities, especially getting up and down from a chair, taking four or more medications, serious vision problems, hearing loss and history of falls. In addition to reviewing risk-factor related answers on surveys, during the screening process physical therapists scored the Get Up and Go, and participants who scored greater than 22 seconds on pre-screen were

noted as possible follow-up referrals for physical therapy. From this objective screening data and weighting method, given the age of Carolina Village participants and their performance on screening and pre-surveys, intensive case management was provided to assist participants who wished to enter physical therapy and were deemed at risk of falling. At other sites, the same informal risk assessment was used to determine participants who were at risk at other sites, and follow-up phone calls were made in response to offer support in arranging for therapy or other interventions.

With data entry into SPSS 13.0 complete, the researchers are working with a research analyst to take a variety of self-report measures as well as GU&G and AF scores to determine a formal weighting system. This will increase the probability of matching appropriate intervention and education strategies to those who need them most.

For the purposes of this report, the relationships of some of these key risk factors to each other and to fall history have been correlated. The results below could suggest who among our participants may be at risk and could be appropriate physical therapy referrals. Frequency of falling in the last three months correlated very highly with the number of times respondents fell in the prior three months. In other words, there appeared to be a tendency or pattern of falling that exceeded the last three months for this sample.

The frequency of falls in the last three months negatively correlated with vision problems suggesting that the fewer vision problems participants had, the fewer falls they had. There was very strong correlation between the GU&G and frequency of falls in the last three months. In other words, if GU&G scores were high, the frequency of falls was also high over the last three months.

Based on the correlation table below, the Animal Fluency Score performed as expected; as age went up AF score went down. Also, as GU&G Score went up (denoting fall risk), the AF Score went down (denoting cognitive decline and potential fall risk).

In a review of literature, many of the following variables are indicated as risk factors for falls, including: taking four or more medications, dementia, hearing and vision impairments, a history of falls, alcohol consumption, age 80+, fear of falling and difficulty getting in and out of a chair (CDC 2005). Interestingly, however, for this sample, the correlation between these risk factors and fall history was not significant. Perhaps this study does not comprise enough data to make an informed decision on the need to access these risk factors as part of the screening mechanism.

Does Case Management Affect Physician Referrals and Insure Access to P.T.

For the older respondents at Carolina Village, clearly case management greatly improved the likelihood of physician referrals and follow-up physical therapy and treatment for at-risk individuals. It is of interest that staff of the Village reported that there were 16 referrals or 23% of the respondents who participated in physical therapy after fall prevention education. On post-survey, however, 24 respondents (40%) indicated that they had initiated a physical therapy program following the “No More Falls” educational and screening program. Those who completed the second survey may have been more dedicated to preventing falls, and this post survey data was completed weeks after the original survey and report of staff. This indicated that case management made a significant difference in support of ensuring that at-risk respondents had access to physical therapy evaluation and treatment. In follow-up calls to the

administration of the facility, researchers learned that in all instances the referrals made were viewed as Medicare-reimbursable by physical therapy staff.

Interestingly, the at-risk participants at Sammy Williams Senior Center for whom physical therapy was discussed felt that they did not want to attend because of cost and transportation. On the other hand, on follow-up calls to participants at Kenmure, the researchers found that a number of the at-risk participants had already arranged for therapy by talking with their physicians.

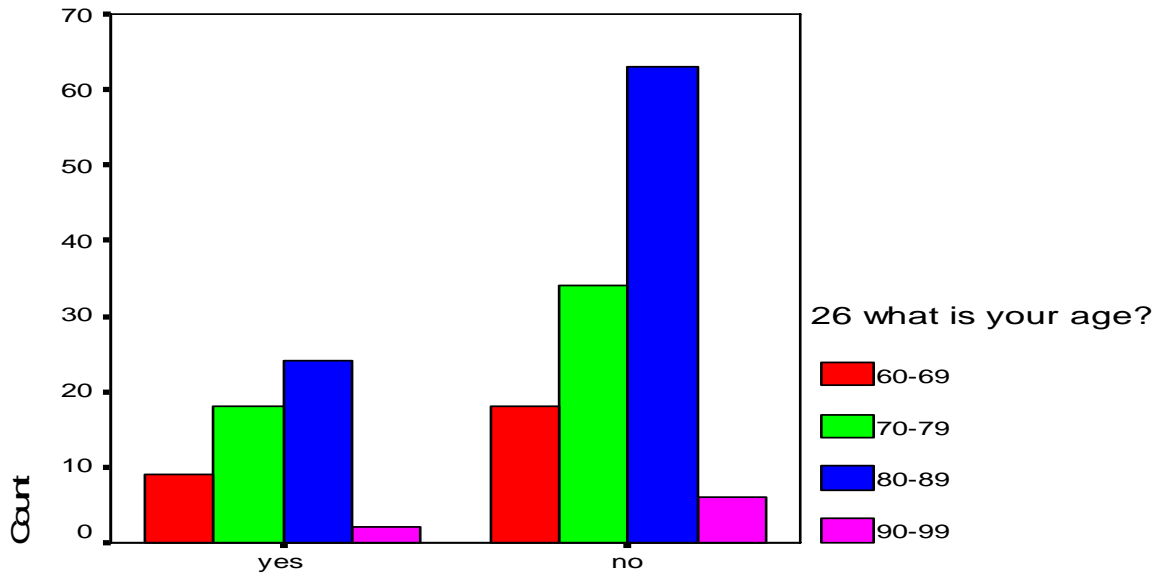
Given that the overall referral rate to physical therapy was 25% for the entire sample based on pre- and post-survey data and that, at Carolina Village alone, 40% of respondents on the post-survey reported they had enrolled in physical therapy since the education and screening program, it appears that case management of older more at-risk populations is very helpful in ensuring access to therapy.

Descriptives

				N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum	Between-Component Variance
						Lower Bound	Upper Bound					
GUGpre	1.00	86	23.3203	7.15020	.77103	21.7873	24.8534	15.12	47.34			
	2.00	65	24.4768	9.39577	1.16540	22.1486	26.8049	15.00	65.00			
	3.00	16	23.5756	7.16214	1.79054	19.7592	27.3921	16.75	38.84			
	Total	167	23.7949	8.07174	.62461	22.5617	25.0281	15.00	65.00			
	Model	Fixed Effects			8.10188	.62694	22.5570	25.0328				
	Random Effects				.62694(a)	21.0974(a)	26.4924(a)					-.84400
GUpost	1.00	71	21.5301	5.72355	.67926	20.1754	22.8849	14.00	39.96			
	2.00	56	23.4563	9.12792	1.21977	21.0118	25.9007	13.72	62.00			
	3.00	14	23.9486	6.79945	1.81723	20.0227	27.8745	15.96	35.20			
	Total	141	22.5352	7.37946	.62146	21.3066	23.7639	13.72	62.00			
	Model	Fixed Effects			7.36064	.61988	21.3096	23.7609				
	Random Effects				.76462	19.2453	25.8251					.47583
AF	1.00	83	15.0964	4.77701	.52435	14.0533	16.1395	5.00	26.00			
	2.00	66	15.6061	3.67058	.45182	14.7037	16.5084	9.00	30.00			
	3.00	17	14.8235	4.51712	1.09556	12.5010	17.1460	7.00	22.00			
	Total	166	15.2711	4.32526	.33571	14.6083	15.9339	5.00	30.00			
	Model	Fixed Effects			4.34230	.33703	14.6056	15.9366				
	Random Effects				.33703(a)	13.8210(a)	16.7212(a)					-.25246

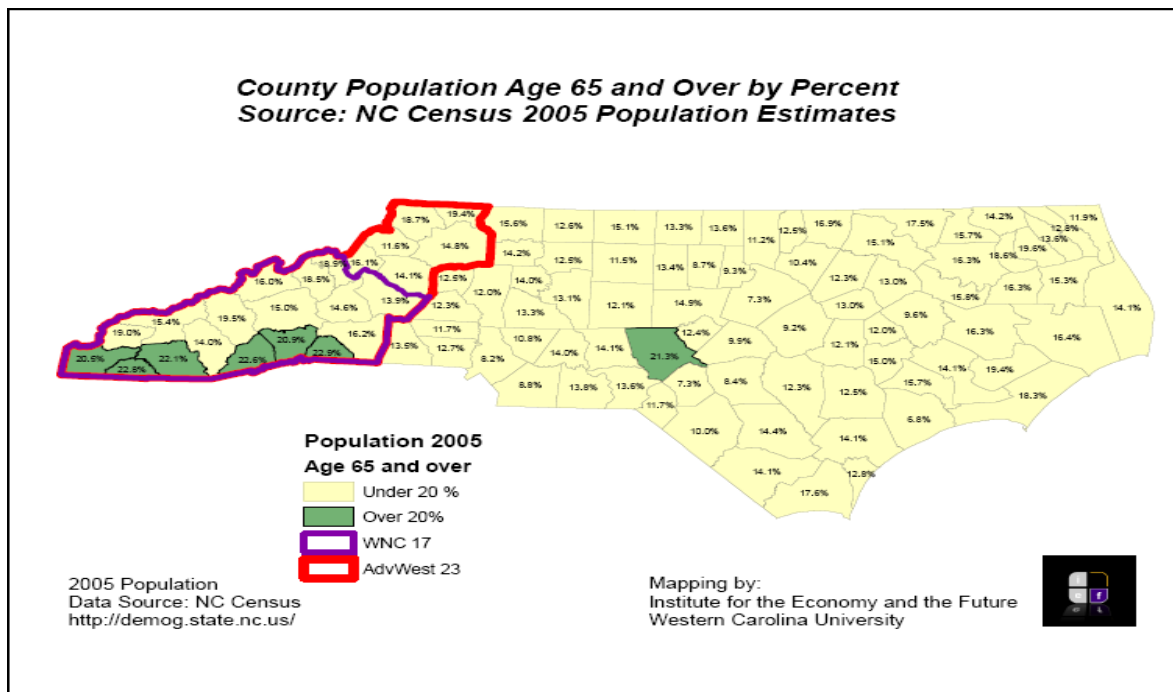
Warning: Between-component variance is negative. It was replaced by 0.0 in computing this random effects measure.

Given the increasing demography of the oldest-old cohort combined with statistics such as these, we should be very concerned about intervention with this population. The following chart demonstrates incidence of falls in the last three months in comparison to age ranges of respondents.



12. falling in last three months

Figure 12 below indicates trending in Western North Carolina regarding the growing aging demography that suggests that falls need to be viewed as a major concern.



Where and what type of fall prevention programs should be made available?

On the self-report pre- and post-surveys, respondents ranked the following items in priority (highest to lowest priority) as most helpful to them in avoiding falls.

1. Exercise programs
2. Lectures
3. Physical Therapy
4. Home safety
5. Screenings

Screening programs, according to literature, are very important (Casteel, Peek-Asa, Lacsamana, Vazquez and Kraus, 2004). It is likely that the reason participants rated this lower related to embarrassment about fall risks. Anecdotally, the researchers observed that quite a few individuals who appeared to be at risk of falling refused the screening process.

The researchers were not surprised that “home safety assessments” were viewed as a lesser priority. When residents of Carolina Village were offered home free home safety assessments, only twelve residents agreed to have such assessments. This most likely was due to respondents’ concerns about housekeeping issues or privacy issues related to having unfamiliar screeners visit their homes. Of the twelve residents who agreed to have home safety assessments, in many cases recommendations were made that could decrease safety hazards. Throw rugs were an especially dangerous issue common to many homes.

What Are the Obstacles to Participating in a Fall Prevention Program?

Obstacles: In order to assess economically diverse aging populations, several different sites were selected. The Sammy Williams Senior Center (SW) site had the largest proportion of respondents with income under \$20,000 with 55% reporting such. The Edneyville Senior Center reported in with 13% of respondents in the low income group; however, only four participants responded to the question. Pardee Education Center (PEC) and Carolina Village (CV) reported in with 16% of participants in the under \$20,000 income group.

For the over \$20,000 income group, Carolina Village reported 46%, Pardee Education Center reported 25%, Kenmure reported 27% and Sammy Williams Senior Center reported 1.5%.

Obstacles Rated by Respondents with Income under \$20,000

On the pre-test, 31 of 166 respondents (18.7%) reported an income of less than \$20,000. For this group, the following obstacles would prevent them from attending a falls prevention program:

- Transportation (52%)
- Cost (35%)
- Location (35%)
- Scheduling (26%)
- Chronic illness (13%)

Owning a Car

Of those respondents who reported that transportation would be an obstacle to attending a falls prevention program, 81% reported that they did not own a car. The following charts highlight how annual income and transportation relate as obstacles to fall prevention effort.

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
15b transportation prevent program attend? * 34a own a car * 36 annual income	13	7.0%	172	93.0%	185	100.0%

Obstacles Rated By Respondents with Income over \$20,000

Of the sample, 73% (135 individuals) reported that their income exceeded \$20,000 or more annually. Of these respondents, the following obstacles would prevent them from attending a falls prevention program:

- Scheduling (61%)
- Location (37%)
- Cost (14%)
- Transportation (10%)
- Chronic illness (10%)

Annual Income of Respondents

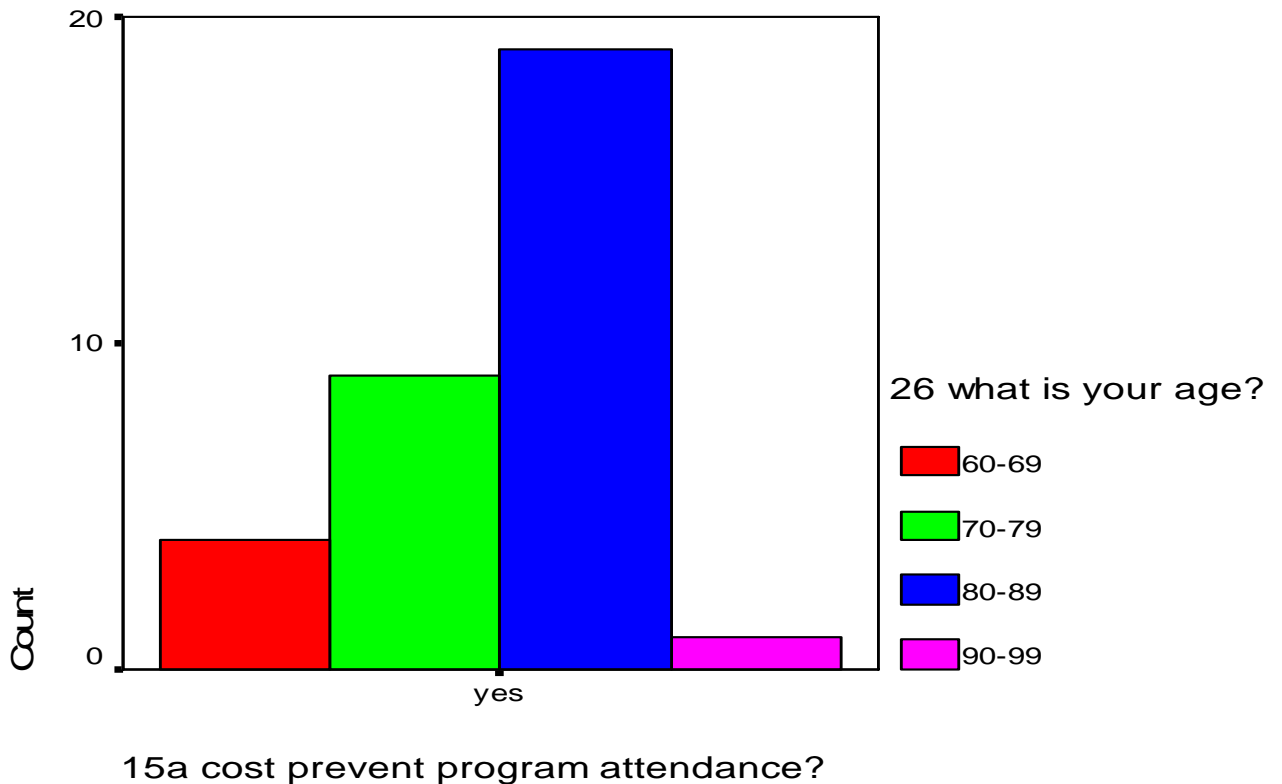
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	under 20,000	31	16.8	18.7	18.7
	over 20,000	135	73.0	81.3	100.0
	Total	166	89.7	100.0	
Missing	System	19	10.3		
Total		185	100.0		

Driving and Falls History

Of those who responded that they drive with no restrictions (73), 19% reported falling within the last three months.

Age-Related Obstacles

In the survey process, respondents could check more than one obstacle from a list. Clearly, the 80-89 year olds reported a greater number of obstacles than those older and younger than they were. On average, this group accounted for between 20-50% of the “yes” responses to the obstacles. It was interesting that this age group tends to be at greatest fall risk but report the largest number of obstacles. This has implications for future program intervention design. The following bar graph denotes the impact of cost, as one obstacle example, on fall prevention program attendance in the different age cohorts. Clearly, for those in the 80-89 group, self-reports indicate that cost would play a role in participation in fall prevention programs.



The following table corroborates the perceived obstacles that affect participation in fall prevention programs.

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
15a cost prevent program attendance? * 26 what is your age?	33	17.8%	152	82.2%	185	100.0%
15b transportation prevent program attend? * 26 what is your age?	33	17.8%	152	82.2%	185	100.0%
15c chronic illness prevent program attend? * 26 what is your age?	19	10.3%	166	89.7%	185	100.0%
15d. location prevents attendance? * 26 what is your age?	64	34.6%	121	65.4%	185	100.0%
15e schedule prevents	99	53.5%	86	46.5%	185	100.0%
Program attends? * 26 what is your age?						

Conclusions

From this research study, important conclusions can be drawn. First and foremost, considering Henderson County’s significant aging demography with more than 21.5% of its population over sixty-five and with a quickly-growing at-risk 80-89-age cohort, fall prevention must be viewed as a priority. Based on literature review (CDC, 2005), falls lead to premature institutionalization, injury and death. Research results of this study strongly suggest that fall prevention interventions should focus on helping seniors understand that falls are not a normal part of aging, for as seen in the 10% shift in attitude in this study, this can have influence of fear of falling and confidence levels in some daily activities. Since some seniors view falling as significant only if injury occurs, it is important to address this issue educationally, emphasizing that a history of falling and other fall-risk factors are harbingers of impending injury. Previous research on fear of falling as well as this study suggest that by decreasing fear of falling, seniors may experience fewer falls. From the education and screening portions of this research, one can glean that there are clear indicators and risk factors that can be proactively addressed, and through case management efforts, there is a greater likelihood that physicians will refer those at risk of falling to physical therapy programs.

Case management efforts may be most effective once obstacles such as cost, transportation, location and scheduling are addressed. For this reason, the researchers recommend development of an ongoing fall prevention program that combines education, exercise, screenings and physical therapy at sites such as senior centers, country clubs and neighborhoods that are beyond hospital facilities. Since the anecdotal response to this research project was quite positive, and many participants indicated they need to be reminded of how to avoid falls, a lengthier, more comprehensive fall prevention program should be considered.

While costs of such a program may be a concern for some seniors with incomes less than \$20,000 annually, the Medicare-coverable physical therapy visits and savings to hospital systems on extended stays after fall related injuries for certain populations would more than help offset the small costs of setting up and maintaining such programs.

This research also emphasizes the great fear that many seniors have about falling. Such fear can paralyze aging adults socially, causing them to withdraw from social activities and become less physically active. This reduces the likelihood that seniors can remain independent and confident while living in their home environment. If fall prevention programming is not considered for the purposes of reducing the pain and suffering and significant healthcare costs, it is worthwhile to present such programs to enhance the quality of life of aging adults.

Discussion

The survey was entirely self-report though there were objective measures in the Get Up and Go test and the Animal Fluency test. Questions included whether the respondents had fallen in the past three months and prior to the past three months. It would be important in a follow-up project to find out how participants felt if they did report falling.

In this survey, going up and down the stairs was the lowest of all confidence levels at 49% and directly related to fear of falling. This could be addressed as part of the development of a structured falls prevention program. Structuring a comprehensive falls prevention program would be an important aspect of any community-wide falls prevention strategy. Individualized therapy, exercise programs, and other interventions could still be utilized for those older adults who did not feel comfortable in a structured program with case management available for assistance.

This study did lack ethnic diversity as most of the participants were Caucasian, though there was diversity in socio-economic status. Further studies should include participants of other ethnic groups for comparison. Language may be a barrier to participation among Latinos and other culturally differing participants.

With Western North Carolina's growth due to retiree migration, the region is fast becoming a world-class retirement Mecca. In such a place, given the incidence of falls in the aging population, hospitals and other health care providers need to heed the opportunity to intervene in the pathway to disablement that falls produce.

Further studies should explore solutions to the barriers to participation that were identified in this study. Consideration may be given to mobile rehabilitation units, transportation solutions and cost assistance for low income participants. Future program development could include a "No More Falls" six-week multifaceted program much like Cardiac Rehab and Pulmonary Rehab that would include:

- * Home safety evaluations/ elimination of environmental hazards
- * Management of medication and alcohol use
- * Development of lower limb strength and balance
- * Identification and treatment of existing vision and hearing impairments
- * Nutritional assessment
- * Referrals to health services and community programs

Fall prevention programs focused on independent elderly that can help maintain independence will have the greatest impact on both the individual and the health care system because the prevention is primary. Because falls represent such a large contribution to the loss of independence, fall prevention programs potentially could have a very strong impact.

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Appendix

Managing Your Medications

In this lifesaving workshop, Pardee Hospital Geriatric Care Manager, Jeanne Rathburn, R.N, BC., B.S., will explain the problems that can occur when aging adults are not compliant in taking their medications. She will discuss common issues that stem from having multiple medical care providers such as over-dosage related to duplication of prescriptions, missed doses, drug interactions and multiple medications. Explaining how taking multiple medications can trigger falls, she will encourage participants to have their medications reviewed every six months. An inexpensive but effective method of organizing medications will be suggested to ensure that medicines are taken properly and that the greatest health benefits are derived. Information pertaining to common supplements and their influence on medications will be shared. Medication resource sites on the Internet that provide support in obtaining important information about medications will be shared. A pharmacist will answer individual questions and review medication lists and dosages, so bring your medication list if you are interested.

Maintaining Bone and Joint Function as We Age

To achieve the best quality of life as we age, it is important to keep our skeletal framework functioning well. Orthopedic problems are a common source of pain and debility for many aging adults. Local orthopedic surgeon, Werner Brooks, M.D., will discuss the most prevalent bone and joint problems, their symptoms and treatment and how to maintain bone and joint health as we age. Pardee Hospital's Licensed Physical Therapist, Jason Morgan, will explain rehabilitation options related to bone and joint dilemmas. He will make recommendations for avoiding bone and joint issues and the nasty falls often associated with them. Focusing on the mind/body link, he will emphasize the importance of increasing flexibility and avoiding stiffness and weakness as we age.

No More Falls: On Your Feet, Not the Floor

Falls can cause serious injury, threatening your independence and your life. In fact, among older adults who fall, 20 to 30 percent suffer moderate to severe injuries such as hip fractures and traumatic brain injuries that reduce mobility and can result in premature death. Pardee Hospital Licensed Physical Therapist, Chloe Egan, will help us understand what causes us to fall and how we can reduce our risks of falling. She will explain ways of enhancing lower body strength and balance and recommend modifications that can be made to the home environment to support safety as we move. Taking multiple medications can increase our risks of falls. Egan will suggest ways to deal with this issue. Screening for fall risk will be conducted prior to and after the educational program. One third of adults age 65 and older fall each year, so join us for this workshop and learn to stay on your feet, not the floor!

Focus Groups

Focus group research was conducted at the Pardee Health Education Center at the Blue Ridge Mall in October of 2006 and at Sammy Williams and Edneyville Senior Centers in February 2007. These focus group experiences were utilized to gain an understanding of how aging adults fall. Most striking was the continual excuse-making for falls that respondents reported. There was a significant effort to minimize their falls by explaining that there was a reason within their control that the fall happened. In the focus study, when respondents were asked “what is a fall,” the researcher learned that it was clearly important that seniors define falls on their own terms. The researchers gleaned that there is a clear desire on the part of older adults to avoid falls and that they are highly aware that a bad fall can lead to hospitalization and stays in a nursing home. Participants expressed a sincere willingness to participate in the project and felt that they were helping others as well as themselves in the process of providing their views on the subject.