HAP-719 (Advanced Statistics in Health Services Research)

(Project 2: Final Report)

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Introduction:

The National Survey of Residential Care Facilities (NSRCF) is a first-of-its-kind national data collection effort to collect information about the characteristics of residential care facilities, such as assisted living residences, board and care homes, congregate care, enriched housing programs, homes for the aged, personal care homes, and shared housing establishments. **The objective of present study is to examine the descriptive statistics of chronic health conditions (stroke, heart disease, Alzheimer/dementia, COPD) and falls as well as age, gender, and Medicaid for the sample. Also to determine the significant associations between falls and the independent variables age, gender, and Medicaid to assess the health conditions on falls.**

Materials and Methods:

Data Description:

The 2010 National Survey of Residential Care Facilities (NSRCF), with a sample size of 8094, was conducted by the Centers for Disease Control and Prevention (CDC) and the National Center for Health Statistics. Data were gathered through in-person interviews with facility directors or designated staff rather than directly from residents. Residents' demographics, living arrangements, activities, health conditions (both physical and mental), cognitive and physical functioning, and services received were all collected.

Statistical Study and tests used:

In this study, to analyze the data and draw conclusions about the research topic, descriptive statistics, bivariate analysis (Chi Square Distribution), and Logistic regression analysis at an alpha value of 0.05 techniques are used to determine the effect.

Statistical Analysis Software:

STATA17 statistical software was used to perform the statistical analysis for this project.

Results:

Analysis of Descriptive Statistics:

Resident’s age range from 64 to 85; 15.18 percent are under the age of 64, 34.85 percent are between the age of 65 and 85, and the remainders are over the age of 85. Of the 7903

residents, 5387 (68.16 %) are female, while 2516 (31.84 %) are male. The prevalence of chronic diseases among residents varies according to the disease. COPD and stroke residents have nearly identical percentages of 10.82 and 10.97 respectively. Only 32.52 percent have a history of cardiovascular disease, while 42.76 percent have Alzheimer's. Previously, only about 13.87 percent of the population had died. Medicaid only covers about 23.74 percent of residents' costs.

Table.1: Descriptive Statistics of all the variables

VARIABLES	SAMPLE SIZE (n = 7903)	Percent (%)
Age of the Resident		
64	1200	15.18
65-84	2754	34.85
>=85	3949	49.97
Resident's Gender		
Male	2516	31.84
Female	5387	68.16
Stroke		
Yes	867	10.97
No	7036	89.03
Alzheimer's/ another dementia		
Yes	3379	42.76
No	4524	57.24
Heart Disease		
No	5333	67.48
Yes	2570	32.52
Falls		
No	6807	86.13
Yes	1096	13.87
COPD		
Yes	855	10.82
No	7048	89.18
Paid by Medicaid		
No	6027	76.26
Yes	1876	23.74

Analysis of Bivariate analysis (Chi Square distribution):

Bivariate analyses of the dependent variable falls and each independent variable separately. Because the variables are categorical, the Chi-Square distribution test is used to establish the relationship.

Residents' age, gender, heart disease, and Alzheimer's disease all have p-values of 0.00 which is below 0.05, indicating that the variables are related to the fall. The other two chronic conditions, stroke and COPD, have no statistical association with the fall based on p values greater than 0.05. According to the p value of 0.584, which is greater than 0.05, the payment method, whether Medicaid or not, has no relationship with the resident's fall.

Table.2: Results of bivariate analyses (Chi-Square Distribution Test)

VARIABLES	FALLS n (%)	NO FALLS n (%)	Chi2 VALUE	P- VALUE
Age of the Resident			58.1976	0.000
64	92 (7.67)	1108 (92.33)		
65-84	363 (13.18)	2391 (86.82)		
>=85	641 (16.23)	3308 (83.77)		
Resident's Gender			44.915	0.000
Male	253 (10.06)	2263 (89.94)		
Female	843 (15.65)	4544 (84.35)		
Stroke			0.0166	0.898
Yes	119 (13.73)	748 (86.27)		
No	977 (13.89)	6059 (86.11)		
Alzheimer's			36.1531	0.000
Yes	560 (16.27)	2819 (83.43)		
No	536 (11.85)	3988 (88.15)		
Heart Disease			11.3965	0.001
No	691 (12.96)	4642 (87.04)		
Yes	405 (15.76)	2165 (84.24)		
COPD			0.3410	0.559
Yes	113 (13.22)	742 (86.78)		
No	983 (13.95)	6065 (86.05)		
Paid by Medicaid			0.3005	0.584
No	843 (13.99)	5184 (86.01)		
Yes	253 (13.49)	1623 (86.51)		

n = sample size, % = percentage of the falls in each variable; Level of significance is 0.05

Analysis of Logistic Regression:

For the independent variables, the reference groups will be 'no' for stroke, 'no' for alzheimers/dementia, 'no' for heart disease, 'no' for COPD, '65-84' age group for age, 'female' for gender, and 'no' for Medicaid.

In the sample size, there are 7903 observations. With a value of 116.57 and a p-value of 0.000, the likelihood ratio chi-square test indicates that the model as a whole fits significantly better than an empty model. In general, this is a fantastic model.

Dementia/alzheimers has an odds ratio of 1.32, which means that people with dementia/alzheimers have a 32% higher chance of falling than those without dementia/alzheimers. The p-value is 0.00, and the 95% CI ranges from 1.16 to 1.51.

People who have heart disease have an odds ratio of 1.18, which means they are 18% more likely to fall than those who do not. The p-value is 0.013, and the 95 percent confidence interval (CI) ranges from 1.03 to 1.36, indicating that this is a significant relationship.

People aged 64 have a 0.65 odds ratio, which means they are 35% less likely to fall than those aged 65 to 84. The p-value is 0.001, and the 95% CI is 0.50 to 0.84, indicating that this is a significant relationship. People over 85, on the other hand, have a 1.24 odds ratio, which means they are 24% more likely to die than those aged 65-84. The p-value for this relationship is 0.003, and the 95% CI ranges from 1.07 to 1.43.

Males have a 0.68 odds ratio compared to females, which means they are 32% less likely to fall. Because the p-value is 0.00 and the 95 percent CI ranges from 0.54 to 0.79, this is a significant relationship.

People with Medicaid-covered medical expenses are 1.18 times more likely to fall than those without. The p-value is 0.037, and the 95 percent confidence interval (CI) ranges from 1.01 to 1.39, indicating that there is a significant relationship.

Finally, falls are unaffected by stroke and copd. Because both variables' p-values exceed alpha (0.05).

Table.3: Logistic Regression

VARIABLES	FALLS n (%)	P- VALUE
Age of the Resident		0.000
64	92 (7.67)	
65-84	363 (13.18)	
>=85	641 (16.23)	
Resident's Gender		0.000
Male	253 (10.06)	
Female	843 (15.65)	
Stroke		0.898
Yes	119 (13.73)	
No	977 (13.89)	
Alzheimer's		0.000
Yes	560 (16.27)	
No	536 (11.85)	
Heart Disease		0.001
No	691 (12.96)	
Yes	405 (15.76)	
COPD		0.559
Yes	113 (13.22)	
No	983 (13.95)	
Paid by Medicaid		0.584
No	843 (13.99)	
Yes	253 (13.49)	

n = sample size, % = percentage of the falls in each variable; Level of significance is 0.05

Discussion:

Residents with Alzheimer's/dementia are more likely to fall than those who do not, according to this study. This finding is similar to Fernando et al .'s, who identified falls as a risk factor for people with Alzheimer's or other dementia-related illnesses (Fernando et al., 2017). A study conducted by Lee K et al. revealed that the presence of heart problems increased the risk of falling by 43% (Lee K et al., 2016), which is quite similar to our study's findings, which revealed that the risk of falling increased by 19% in residents with heart problems. Simpson et al. discovered that people who have had a stroke are 1.77 times more likely to fall, whereas our study discovered that residents who have had a stroke are 59% less likely to

fall (Simpson et al., 2011). According to an Al-Alma study, falling is a risk factor for people 65 and older, and one-third of people 65 and older fall every year (Al-Aama, 2011). This finding is consistent with our previous research, which discovered that the risk of falling increases with age in the elderly population. Greenberg et al. (2016) discovered no significant difference in the number of falls experienced by males and females, whereas this study discovered that females are 3.4 times more likely than males to fall. Florence et al. (2018) discovered that Medicaid-related falls are marginally significant (Florence et al., 2018), which is consistent with our findings of 18% higher falls in Medicaid-eligible residents.

Conclusion:

To summarize, female residents fell more than male residents, and residents over the age of 85 fell more than those aged 65-84 years and 64 years. Residents with Alzheimer's or other dementia, as well as heart problems, have a higher fall rate than residents with stroke or COPD. Residents whose medical expenses were covered by Medicaid fell far more than those whose expenses were not.

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