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Emergency Department Utilization and Self-Reported Symptoms in Community-Dwelling Older Adults

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Abstract

Background—The rise in emergency department (ED) utilization among older adults is a nursing concern, because emergency nurses are uniquely positioned to positively impact the care of older adults. Symptoms have been associated with ED utilization, however, it remains unclear if symptoms are the primary reason for ED utilization.

Purpose—Describe the self-reported symptoms of community-dwelling older adults prior to accessing the emergency department. Examine the differences in self-reported symptoms among those who utilized the emergency department, and those who did not.

Procedures—A prospective longitudinal design was used. The sample included 403 community-dwelling older adults 75 years and older. Baseline in-home interviews were conducted followed by monthly telephone interviews over 15 months.

Main Findings—Commonly reported symptoms at baseline included pain, feeling tired, and having shortness of breath. In univariate analysis, pain, shortness of breath, fair/poor well-being,

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and feeling tired were significantly correlated with ED utilization. In multivariable models, problems with balance, and fair/poor well-being were significantly associated with ED utilization.

Conclusions—Several symptoms were common among this cohort of older adults. However, there were no significant differences in the types of symptoms reported by older adults who utilized the emergency department compared to those who did not use the emergency department. Based on these findings, symptoms among community-dwelling older adults may not be the primary reason for ED utilization.

Keywords

ADL; aged; locomotion; rural populations; emergency-service

Introduction and Review of Literature

The use of emergency department (ED) services is common among older adults. In 2011, older adults in the United States (U.S.) made 40.7 million ED visits, and approximately 43% of these ED visits resulted in hospitalization.¹ Among individuals 65 and older that utilized the emergency department in the U.S., 12.2% were White; 2.3% were Black of African American; and 4.1% were classified as “other”.² As the number of older adults with chronic illness and multi-morbidity increases, ED utilization is predicted to rise among this segment of the population.^{3–6} Geographic regions in the U.S. seem to have an impact on the number of ED visits per 100 persons per year. The southern region had the highest number of ED visits with a rate of 48.7 per 100 persons per year. The Northeast accounted for a rate of 44.3 the Midwest had a rate of 45.2 and the west had the lowest number of ED visits per 100 persons per year with 37.2. In addition, many developed nations anticipate a steady rise of ED utilization, which may result in increased health care resource consumption.^{7,8} While the rise in ED utilization among older adults is a nursing concern, there are limited studies concerning ED utilization by community-dwelling older adults published in nursing journals, and more nurse-led interdisciplinary research needs to be conducted to fill this gap. The rise in ED use is also concerning because ED use is associated with negative health outcomes, especially in older adults. The upward trend in ED utilization is particularly problematic because older adults receive more diagnostic testing that could be harmful and may even be unnecessary while in the emergency department, compared to their younger counterparts.⁹ Studies show that there is a significant increase in the use of resources when older adults visit the emergency department. This includes doubling of intensive care services, increased number of imaging tests, electro cardio gram, and cardiac monitoring as well as inappropriate medication for older adults.⁸ Older adults are also 5.6 times more likely to be hospitalized from the emergency department, and the risks for repeat ED visits increases with age.^{2,6,7} Once admitted to the hospital, inadequate discharge planning for older adults with multifaceted co-morbidities is common.^{7,10} This is further complicated by a lack of home follow-up or home follow up that does not address the chronic symptom self-management in older adults recently discharged from the hospital potentially leading to repeat ED visits. However, multidisciplinary nurse-directed transitional care programs have been successful in reducing hospitalization, and ED visits.^{11,12} For example, a Clinical Nurse Specialist (CNS) directed transitional care program with a chronic disease self-

management focus significantly reduced ED utilization.¹² This multi-faceted transitional program included making the initial visit in the hospital and conducting a follow-up home visit within 24–48 hours post discharge. During the first visit in the hospital, the CNS completed a comprehensive physical assessment, reviewed medication, and assessed patient risk factors and the presence of social support. Importantly, this nurse-led program also included an identification of patients' self-management learning needs, and discussion of goals and safe transitioning home.¹²

Reasons for ED Utilization in Community-Dwelling Older Adults

Transitional programs with a focus on chronic illness self-management may be instrumental to address the most common reasons to prevent ED utilization in the older adult. However studies show that community-dwelling older adults may utilize the emergency department for a number of reasons, and more research is needed to understand the underlying factors. The 10 most common reasons cited in the literature that bring older adults to the emergency department include chest pain, shortness of breath, abdominal pain, vertigo, back pain, accident, syncope, and dyspnea.⁸ In addition, 29% of all ED visits by older adults are related to injury such as falls which are known to increase with age, decline in Activities of Daily Living (ADLs), and associated frailty.^{3,13} Further, studies suggest that the frequency of physical and psychological symptoms, as well as the severity of these symptoms may be one of the leading causes of ED utilization in the U.S.^{8,14–16} In addition, palliative care patients may use the emergency department to address pain and symptom management rather than accessing primary care providers or hospice services.^{16–18} Further, there may be differences between rural and urban dwelling older adults in regards to access to primary care providers and receiving age-appropriate care in rural emergency departments due to geographic barriers and poverty.^{1,19} A recent report showed that the number of ED visits per 100 persons per year was slightly higher for the non-metropolitan areas with a rate of 45.2 compared to geographic regions considered metropolitan with a rate of 44.3.² This could be problematic for the vulnerable older adult, because studies show that there are few physicians in the rural setting with a board-certification for emergency medicine.²⁰ While these study findings about the reasons for older adults utilizing the emergency department suggest that a convergence of factors may be responsible for the rise in ED utilization, acute or chronic illness symptoms have been viewed as the primary factors associated with ED utilization by older adults.

Self-Perceived Symptoms and ED Utilization among Older Adults

In spite of targeted approaches to assess and treat symptoms in older community-dwelling older adults¹⁷, unmanaged symptoms continue to be associated with increased overall healthcare utilization including ED use, and mortality.^{8,21} Unrelieved symptoms may lead to physical and cognitive decline which could result in greater anxiety and increased suffering.²² However, there are gaps in our understanding of the impact that illness-related symptoms may have on older adult's utilization of the emergency department. Previous studies have predominantly examined reasons for ED utilization retrospectively. In addition, studies that have retrospectively analyzed the symptoms that have led older adults to the ED visit, have no comparison group of individuals who have similar symptoms and yet did not

utilize the emergency department.^{6,8,22,23} Categorizing the symptoms for ED utilization based on diagnosis, or conditions such as accidents, chronic or acute illness, and mental status changes²³ are problematic because they exclude the patients' self-perceived symptoms prior to the ED visit. The descriptions of symptoms from the patients' perspective that have resulted in the ED visit is important to develop tailored multidisciplinary interventions to address the rising numbers of ED utilization, and decrease unnecessary ED visits. However, studies that describe the self-perceived patient symptoms prior to visiting the emergency department are minimal.⁸ It remains unclear if illness-related symptoms among community-dwelling older adults are the primary reason for ED utilization, and which of the symptoms experienced are the most likely to lead to ED utilization. Therefore, the purpose of this current analysis is to describe the self-reported symptoms of community-dwelling older adults prior to accessing the emergency department. In addition, the differences in self-reported symptoms among two groups of participants will be examined: Those who utilized the emergency department; and participants who did not utilize the emergency department. We are unaware of any prospective longitudinal study that has followed a cohort of community-dwelling older adults and examined self-reported symptoms prior to ED utilization.

Methods

Participants and Setting

This study is a secondary analysis of data from participants in the University of Alabama (UAB) Study of Aging II, a study of community-dwelling older adult's age 75 years and older with the purpose of examining the specific factors that may predict mobility decline.²⁴ Participants in the UAB Study of Aging II were recruited from two prior studies: the UAB Study of Aging I (1999–2008), and the State of Alabama Charting the Course, which was a Long Term Needs Assessment Survey (2002).²⁵ The first phase of the UAB Study of Aging I was a prospective, observational study of a population based sample of 1000 community-dwelling Medicare beneficiaries, stratified by sex, race, and urban/rural residence to study potentially modifiable factors that predict life-space mobility trajectories. Participants were 65 years of age and older at baseline.

The overall purpose of the UAB Study of Aging II is to study the impact of specific events such as surgical and non-surgical hospitalizations, emergency room visits, new non-skin cancer diagnoses, falling, driving cessation, and bereavement on life-space, and factors which may modify any associated life-space change among this population. The inclusion criteria for the Study of Aging II were that participants had to live in one of the 17 Alabama counties of the above studies, be able to communicate on the telephone to schedule an in-home interview appointment, and able to answer questions by themselves. After obtaining informed consent, in-home baseline interviews were conducted between June 2010 and August 2011, followed by a supplemental telephone interview by trained research personnel approximately two weeks later. Subsequently telephone follow-up interviews were conducted monthly. Data from baseline interviews and the first 15 months of follow-up telephone interviews are included in this analysis. The UAB institutional review board approved the study protocol.

Measurements

At baseline, sociodemographic information was collected including age, residence (urban vs. non-urban) self-reported race (African American vs. white), marital status (married, single, divorced, widowed), income, and education. African American or White participants with Hispanic ethnicity may have been admitted if they spoke English. Hispanic ethnicity was not captured in this study. Income, marital status, and education were dichotomized (income < \$12,000 per year vs. \$ 12,000 per year), marital status (married vs. not married), and education (6th grade vs. 7th grade). Baseline measures of health were collected during the initial visit, or phone interview, and subsequently using monthly telephone interviews. Telephone interviews were conducted by trained research personnel using an interview guide. Telephone interviews for research purposes is an acceptable and valid method to gather data, and telephone interviews are widely used in medical and social sciences.²⁶ Older adults often have co-morbidities which are diseases and conditions that co-occur with a primary diagnosis. In this study the Charlson Comorbidity Index was used to obtain a total score based on the participant's co-morbidities to predict the mortality of patients.²⁷ The Charlson Comorbidity Index was developed to enable the categorization of patient comorbidities based on the International Classification of Diseases (ICD) diagnosis codes. Each comorbidity category has a weight ranging from 1 to 6, which is based on adjusted risk of mortality or resource use. The sum of the comorbidity category results in a comorbidity score for a patient, with zero indicating the absence of comorbidities. Higher scores may predict mortality or higher resource use.²⁷ At baseline, a comorbidity count was calculated based on the Charlson Comorbidity Index without consideration of severity, and considered verified based on these criteria: The participant reported the condition, and took at least one medication for the condition; the condition was reported on a questionnaire sent to the participant's physician; or if the condition was noted on a hospital discharge summary. The number of medications was assessed, and only verified diagnoses were used for this analysis. Functional status was measured by assessing difficulty with activities of daily living (ADL).²⁸ Lawton's instrumental activities of daily living (IADL) was also assessed at baseline, and at each monthly interview.²⁹

Self-Reported Symptoms

The inventory of symptoms assessed during each telephone follow-up interview asked participants to report if they had specific symptoms during the month preceding the call. Scores from the Edmonton Symptom Assessment Scale (ESAS),^{16,30–32} the Condensed Memorial Symptom Assessment Scale (CMSAS), and the Brief Symptom Screen (BSS)³³ index were calculated from these reports.

Edmonton Symptom Assessment Scale (ESAS)—The Edmonton Symptom Assessment Scale (ESAS) is a 9-item patient-rated symptom scale developed to assess symptoms in palliative care patients.³⁴ For the present analysis, the nine defined symptoms assessed included: Pain, feeling tired, nausea, depression, anxiety, feeling drowsy, lack of appetite, well-being, and shortness of breath. These symptoms were assessed based on the presence or absence of the symptoms in the past month. Self-reported health status of very good, or excellent was used as a proxy for well-being.

Condensed Memorial Symptom Assessment Scale (CMSAS)—The Condensed Memorial Symptom Assessment Scale (CMSAS) is a 14-item symptom inventory developed from the 32-item Memorial Symptom Assessment Scale Short-Form (MSAS-SF). The CMSAS was developed to assess quality of life and survival based on the physical and psychological symptoms experienced by patients being treated for cancer and/or receiving palliative care. The fourteen symptoms included: Lack of energy, lack of appetite, pain, dry mouth, weight loss, feeling drowsy; shortness of breath, constipation, difficulty concentrating, nausea, worrying, feeling sad, and feeling nervous.³⁰ For the present analysis, a cumulative score was calculated based on the presence or absence of these fourteen symptoms.

Brief Symptom Screen (BSS)—The Brief Symptom Screen (BSS) is a 10-symptom inventory developed from the UAB Study of Aging I.³³ The BSS was used to examine self-reported physical and affective (unpleasant feelings or emotions) symptoms. Physical symptoms included shortness of breath, feeling tired, and problems with balance, leg weakness, and constipation, problems with appetite, pain, stiffness; mental symptoms include anxiousness and anhedonia.³³ For the present analysis, a positive response to the question, “in the past month, have you felt depressed?” was used as a proxy for anhedonia.³⁵ Participants were asked a general question about how they perceived their overall health with “excellent”, “very good”, “good”, “fair” or “poor” well-being as options. During the monthly telephone interview participants were asked if they had been to the emergency room in the last month with a yes/no response option.

Statistical Analysis

Demographic and symptom prevalence data were computed using means and standard deviations for continuous variables, and frequencies (percentages) for categorical variables. Chi-square and Fisher’s exact tests were used to test for differences between two or more groups.³⁶ We used generalized estimating equations (GEE)³⁷ to examine the association between symptom severity and monthly ED utilization over the following month. Analyses were performed at the participant level with GEE, accounting for repeated measurements across participants. GEE utilizes data from all participants (rather than just completers) and provides more robust estimates in the presence of missing data. The GEE model estimated the odds of ED utilization over each monthly interval, using the presence of symptoms at the beginning of the month as the predictor of interest, adjusting for demographics and other participant characteristics. As few participants reported more than 1 emergency department visit in a month, a binary classification of yes/no was used as the outcome. Only symptoms of the index under consideration were included in the models. Separate models were constructed for each of the three symptom indices (ESAS, BSS, and CMSAS). We did not adjust for symptoms in other indices that were not part of the index being modeled. Predictors were added in a stepwise fashion to examine potential mediation effects of symptom severity. The first model included comorbidities, medications, the number of ADL difficulties, and the number of independent ADL difficulties. The second model added the total symptom assessment scale score and the third model added the individual items of the symptom index under consideration. All analyses were performed using SAS/STAT® version 9.3.

Results

Of the 412 participants in the Study of Aging II, we included 403 with at least 1 follow-up. Participants had a mean age of 82.0 (SD 7.96) years, 57.3% were female, and 34.2% were African American. Among the participants, 127 (31.5%) visited the emergency department during the 15 months of follow-up. Characteristics of the study cohort are shown in Table 1 organized by ED utilization or no ED utilization. The participants who utilized the emergency department were noted to take more medications, have higher level of comorbidity with dependence in ADLs and IADL's (all $p < .05$). The socio-economic status of these participants was also a factor with more in the lower income ranks. Monthly telephone follow-up phone calls included assessment of symptoms, and ED utilization. Symptoms frequently reported during the telephone interview included pain (19.5%), feeling tired (12.6%) and shortness of breath (8.6%). In univariate analysis, pain ($p < .000$); shortness of breath, ($p = .019$); feeling tired ($p = .048$); and fair/poor well-being ($p < .000$) were significantly correlated with ED utilization (Table 2).

The predictive ability of the symptoms from the Edmonton Symptom Assessment Scale (ESAS), the Brief Symptom Screen (BSS), and the Condensed Memorial Symptom Assessment Scale (CMSAS) are shown in Table 3. For all symptom indices, model 1 indicated that the number of medications and ADL score were statistically significant predictors of ED utilization over the 15 months of follow-up. Model 2 included the summary score for each of the 3 measures (ESAS, BSS, CMSAS), and there were no significant predictors of ED utilization using summary measures. In Model 3, when the individual symptoms were added to the model for the ESAS, self-report of fair or poor well-being remained significantly associated with ED utilization (Table 3). For the symptoms included in the BSS, having problems with balance was associated with ED utilization (Table 3). None of the individual symptoms of the CMSAS were significant predictors of ED utilization (Table 3).

Discussion

This study is a secondary analysis of data from participants in the University of Alabama (UAB) Study of Aging II. The purpose of this study is to examine the specific factors that may predict mobility decline of community-dwelling older adults in Alabama age 75 years and older²⁴. Participants in the UAB Study of Aging II were recruited from two prior studies: the UAB Study of Aging I (1999–2008), and the State of Alabama Charting the Course study, which was a Long Term Needs Assessment Survey (2002).²⁷ Previous studies have shown symptoms such as pain and shortness of breath as common causes for ED utilization among community-dwelling older adults⁸. We remain unaware of any prospective longitudinal study that has followed a cohort of community-dwelling older adults and examined self-reported symptoms prior to ED utilization. Therefore, the purpose of this analysis was to describe the self-reported symptoms of community-dwelling older adults between June of 2010 and August of 2011, some of whom accessed the emergency department during the course of this study. The differences in self-reported symptoms among those who utilized the emergency department, and those who did not utilized the emergency department were also compared.

Context of Marital Status and Living Alone

Older adults are the largest group of health care users, and the number is rising. The patterns of ED utilization among older adults highlight the need to identify “upstream” factors to better understand reasons for ED utilization, and prevent unnecessary ED visits. Other factors that need to be considered include the social isolation among urban and non-urban older adults, and perceived community-based and family social support.³⁸ Studies show that perceived social isolation may be a factor in ED utilization in this population.³⁹ For example, in another study the perception of social disconnection was reported by 56% (n =100) of older patients who utilized the emergency department with lower clinical urgency³⁹. Older adults reported dissatisfaction with the interaction with others (66%), and reported a perceived lack of social support from family and friends (35%). Older adults may perceive social isolation despite being married and having relationships with families. Social isolation has been linked with depression and acute, and chronic healthcare problems.³⁹ In our study, of participants who were married 11.7% had reported accessing the emergency department compared to 30.5% who had no ED utilization. Widowed (17.4%), separated or divorced (1.5%) participants also tended to use the emergency department more frequently compared to participants who reported not accessing the emergency department. Participants who lived alone (16.9%) or with a spouse (12.2%) or other family member (7.2%) tended to report accessing the emergency department to a greater extent than those who did not use the emergency department. While our study findings show that older adults with spouses tended to use the emergency department to a greater extent, social isolation may be a contributor to accessing the emergency department. Living with family, or being married/having a spouse may not necessarily indicate social connectedness or support. More research is needed to examine how perceived social isolation and social support in older adults may be factors in ED utilization and the self-management of chronic symptoms.

Demographics and Geographic Location

The racial and gender demographics of the study participants roughly match the population demographics of the state of Alabama.⁴⁰ However, our study participants had a lower income than the general population of Alabama. Inclusion criteria for this study was that participants had to be 75 years or older. In contrast, only 15.7% of the population of Alabama is over the age of 65. Living in a rural setting could be a barrier for older adults to accessing the primary care services they need, which could result in emergency department use that could have been prevented.⁴¹ In our study 40.9% of participants lived in a non-urban setting. This is similar to the Alabama rural dwelling population estimates at 41%.⁴⁰ Nearly half of all participants in this study (44.7%) with a combination of Medicare and Private insurance reported not using the emergency department. This could suggest that these participants may have had better symptom management.

Our study explored whether differences between urban and non-urban dwellers exists in terms of utilizing the emergency department. Other studies found that while similar health care needs exist among rural older adults, they are less likely to utilize the emergency department due to geographic barriers such as distance to the hospital, higher rates of poverty, and lack of providers.¹ There is some evidence that rural dwelling Medicare beneficiaries have a lower probability to have primary care follow up; and that they may be

at greater risks to accessing the ED in the 30 days post hospitalization, when compared to urban counterparts.⁴² However, in this study we found no significant association between non-urban or urban community-dwelling participants and their ED utilization. This finding is similar to another study where rural dwelling older adults' ED utilization did not differ significantly compared to their more urban counterparts.¹

Symptoms

While all study participants reported the presence of symptoms including pain, feeling tired, and shortness of breath, there were no significant differences in the presence of these symptoms reported by older adults who used the emergency department, compared with older adults who did not use the emergency department. However, we did find that the number of medications, self-reported difficulty with performing ADLs, and problems with balance were significantly associated with ED utilization. These findings mirror intrinsic fall risk factors that could cause fall-related injuries leading to ED utilization. For example, problems with balance, which are frequently related to visual impairments, hypotension, cardiac rate and rhythm abnormality could lead to falls. The use of sedative-hypnotics, psychotropic and polypharmacy are also known fall risk factors.⁴³ It has been shown that insufficient physical activity leads to decreased muscle strength and functional impairment which has also been associated with falls.^{41,42}

The Advancement of Geriatric Nursing Care in the Emergency Department

Nurses working in the emergency department are uniquely positioned to positively impact the care that older adults receive when they visit the emergency department, and also to prevent a repeat visit. Clinical Nurse Specialists could develop and implement a multi-faceted ED transitional program including obtaining a comprehensive geriatric assessment in the emergency department and conduct a follow-up home visit in 24–48 hours post discharge from the emergency department. Age-appropriate discharge teaching with an emphasis on how older adults and their families can manage their chronic and acute symptoms ensuring a smooth transition from emergency room to home. In addition, a triage program could be developed so that older adults and their families can contact a geriatric emergency nurse for symptom management or other questions if they are unable to connect with their primary care physician. Because older adults have unique age-related needs, emergency nurses should become familiar with the geriatric resources that are available to them through their professional specialty organization.

Emergency nurses are positioned to advocate for the needs of older adults, and provide evidence-based nursing care. Geriatric emergency guidelines should be reviewed regularly during nursing and interdisciplinary meetings, and efforts should be made to follow best practices. Emergency department nurse managers could encourage emergency nurses to obtain the geriatric emergency nurse specialty certification to enhance their geriatric nursing competency. Nurse practitioners with specialized gerontological knowledge are primed to provide community-dwelling older adults holistic care. For example, they could promote physical activity in community-dwelling older adults to prevent functional decline, so that older people could maintain the ability to live independently. Nurse practitioners and other providers could use a proactive approach to teaching older adults and their families about

symptom self-management, and create a plan for managing exacerbations of symptoms so that ED utilization may not be the primary path. Future research should also examine the length of time older adults wait from the onset of self-reported symptoms to deciding to visit the emergency department.

Strengths and Limitations

A strength of our study is the use of prospective data preceding ED visits on a cohort of participants with a high likelihood of having chronic illness symptoms. In addition, the longitudinal nature of this study allowed us to follow people monthly. However, a few caveats need to be addressed. Because this study only examined the presence or absence of symptoms, it is possible that there are symptoms not captured by the assessment scales that were used (ESAS, BSS, and CMSAS), that could be important predictors of ED utilization. While the scales used in this study may not be useful for practice, an awareness of the presence of chronic symptoms could be beneficial to inform a comprehensive geriatric assessment. Our study findings suggest that in addition to assessing self-reported symptoms, a review of the appropriateness of medications, evaluation of performing ADLs, balance and the level of physical activity the patient engages in may be highly beneficial to make targeted treatment recommendation and prevent unnecessary ED visits.

One limitation is that there may have been a month or more between assessing chronic symptoms and ED utilization. Another temporal limitation was that the monthly assessment phone call could not be made immediately before the ED visit because the older adult's decision to visit the emergency department was unpredictable. There is a need for future research based on conceptualizing the differences between and relationships among chronic and acute symptoms. Another limitation was the difficulty in distinguishing between chronic and acute symptoms. It could be that the ED utilization was based on an acute symptoms, which we did not measure. For example, older adults may experience the exacerbation of an existing chronic condition which has been managed well, such as emphysema. It may be difficult to pinpoint the onset of acutely worsening shortness of breath if it gradually becomes worse over months. While an injury such as a fall may be viewed as an acute problem, it may be the culmination of a chronic issue with musculoskeletal weakness due to insufficient physical activity. Another limitation is that we did not measure the severity of symptoms. There is a need for future research that examines the severity of chronic symptoms, and functional decline that may lead to a visit to the emergency department. With the extended exposure to chronic symptoms, there may be a greater likelihood that the severity of symptoms over time could have led to ED utilization. Many older adults with chronic symptoms learn to live with these symptoms making it challenging to identify the moment the symptom becomes severe enough to warrant an ED visit. It may be the accumulative effect of multiple symptoms that do not change over time, which finally leads an adult to decide that an ED visit is necessary.

In addition, this study did not examine the convenience of access to primary care for these participants to determine whether or not this impacted the exacerbation of symptoms, and resulted in emergent situations for older adults. We did not examine the length of time older adults waited from the onset of self-reported symptoms to deciding to visit the emergency

department. Another limitation is that we did not capture Hispanic ethnicity in this study. The population estimate for the state of Alabama in 2015 includes: Whites (69.5%), African Americans (26.8%), Asians (1.3%), American Indian or Alaska Native (0.7%) and Native Hawaiian and Pacific Islander (0.1%). Ethnic groups reported include Hispanics (4.2%).⁴⁰

Conclusion

This study found that the older adults who visited the emergency department, and those who did not visit the emergency department suffered with similar symptoms, including pain, shortness of breath and feeling tired. These symptoms could impact their independent functional ability, and their quality of life. Converging symptoms of pain, shortness of breath and tiredness may be contributing to decreased physical activity, which is known to result in muscles loss and weakness leading to subsequent falls. This converging of symptoms could have resulted in a higher level of comorbidity with dependence in ADL and independent ADL in older adults in this study. Older adults who visited the emergency department had greater numbers of medications, and the socio-economic status was also a factor with more participants in the lower income ranks.

Our findings are in contrast to some other studies where the frequency and severity of symptoms are leading indicators for ED utilization among older adults.^{8, 16} Based on our findings, some community-dwelling older adults may have been going to the emergency department for symptoms. However, there were others in the community with very similar symptoms who did not utilize the emergency department. These findings suggest that symptoms could be necessary—but that symptoms alone—may not be sufficient for a community-dwelling older adult to access the emergency department. Based on our findings, symptoms among community-dwelling older adults may not be the primary reason for ED utilization.

Future Research

Previous studies have used a retrospective design which only captures the “downstream” information about patients’ symptoms after the patient has presented in the emergency department. This makes it difficult to understand the antecedents to the ED visit, and other contextual factors that could be relevant. In addition, there is insufficient comparison between patients with similar symptoms who may not have utilized the emergency department. Older adults with symptoms may choose to suffer in silence instead of seeking help in the emergency room, or they may have sought help through their primary care physician. Future research could examine the decision-making of older adults to visit their primary care physician instead of the emergency department.

Additional research is needed to learn how older adults manage their symptoms and what other factors may prompt them to visit the emergency department. Future research should include a study to examine the self-reported symptoms in community-dwelling older adults, and how long symptoms were present, and the severity of these symptoms prior to ED visits. In addition, the self-management activities older people engage in prior to the ED visit to address or manage their symptoms should be explored, including whether or not older patients have attempted to see their primary care provider. Future studies should also explore

how insufficient mobility and balance problems can be monitored and prevented in community-dwelling older adults.

As discussed in the introduction, older adults who visit the emergency department are more likely to receive potentially unnecessary and harmful testing compared to their younger counterparts, and they are more likely to be admitted to the hospital. If an ED visit is necessary, emergency nurses are the key coordinators of the care older adults receive while in the emergency department, that could affect the ED-to-home transition and prevent unnecessary repeat visits.

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Contribution to Emergency Practice

- To ensure a smooth transition from emergency room to home, emergency nurses need to provide discharge teaching with an emphasis on how older adults and their families can manage their chronic and acute symptoms.
- Symptoms alone may not be the primary reason why older adults access the emergency department. Nurses should consider conducting a comprehensive geriatric assessment to assess other potential factors that may contribute to emergency department visits.

Table 1

Summary characteristics by emergency department utilization over 15 months of follow-up.

	Total N=403	Any ED Utilization N=127	No ED Utilization N=276	p-value
Mean age (SD)	82.0 (7.962)	82.3 (10.088)	82.0 (6.783)	0.715
Race, African American	138 (34.2%)	46 (36.2%)	92 (33.3%)	0.570
Sex, female	231 (57.3%)	81 (63.8%)	150 (54.4%)	0.075
Non-urban residence	165 (40.9%)	57 (44.9%)	108 (39.1%)	0.275
Marital Status				0.370
Married	170 (42.2%)	47 (11.7%)	123 (30.5%)	
Widowed	197 (48.9%)	70 (17.4%)	127 (31.5%)	
Separated / Divorced	24 (6.0%)	6 (1.5%)	18 (4.5%)	
Never Married	12 (3.0%)	4 (1.0%)	8 (2.0%)	
Education				0.563
Less than High School	114 (28.3%)	41 (10.2%)	73 (18.1%)	
High School	122 (30.3%)	37 (9.2%)	85 (21.1%)	
Some College	81 (20.1%)	26 (6.5%)	55 (13.7%)	
College Graduate	86 (21.3%)	23 (5.7%)	63 (15.6%)	
Income				0.223
< \$5,000	19 (4.7%)	8 (2.0%)	11 (2.7%)	
\$5,000 – \$7,999	14 (3.5%)	9 (2.2%)	5 (1.3%)	
\$8,000 – \$11,999	36 (9.0%)	14 (3.5%)	22 (5.5%)	
\$12,000 – \$15,999	64 (16.0%)	18 (4.5%)	46 (11.5%)	
\$16,000 – \$19,999	28 (7.0%)	9 (2.2%)	19 (4.7%)	
\$20,000 – \$29,999	66 (16.5%)	22 (5.5%)	44 (11.0%)	
\$30,000 – \$39,999	86 (21.5%)	22 (5.5%)	64 (16.0%)	
\$40,000 – \$49,999	30 (7.5%)	7 (1.8%)	23 (5.7%)	
\$50,000 – \$74,999	33 (8.2%)	10 (2.5%)	23 (5.7%)	
\$75,000 and above	25 (6.2%)	7 (1.8%)	18 (4.5%)	
Insurance				
No Insurance	1 (0.25%)	0 (0.0%)	1 (0.25%)	1.000
Medicare Only	43 (10.7%)	10 (2.5%)	33 (8.2%)	0.218
VA Only	2 (0.5%)	2 (0.5%)	0 (0.0%)	0.099
Private Only	23 (5.7%)	7 (1.7%)	16 (4.0%)	0.909
Medicare + Medicaid	48 (11.7%)	21 (5.2%)	26 (6.5%)	0.039
Medicare + Medigap	29 (7.2%)	9 (2.2%)	20 (5.0%)	0.954
Medicare + VA	29 (7.2%)	6 (1.5%)	23 (5.7%)	0.193
Medicare + Private	260 (64.5%)	80 (19.9%)	180 (44.7%)	0.665
Residence				
Lives Alone	231 (57.3%)	68 (16.9%)	163 (40.5%)	0.298
Lives with Spouse	173 (42.9%)	49 (12.2%)	124 (30.8%)	0.232
Lives with Other Individual	88 (21.8%)	29 (7.2%)	59 (14.6%)	0.742

	Total N=403	Any ED Utilization N=127	No ED Utilization N=276	p-value
Mean comorbidity count (SD)	2.7 (1.591)	3.1 (1.839)	2.5 (1.431)	<0.001 *
Mean number of medications (SD)	6.1 (3.413)	6.9 (3.943)	5.8 (3.080)	0.001 *
Functional status				
Mean ADL (SD)	1.1 (1.713)	1.6 (1.883)	0.9 (1.590)	<0.001 *
Mean IADL (SD)	1.1 (1.622)	1.5 (1.754)	0.9 (1.518)	<0.001 *

* Denotes p<0.05

ED=Emergency Department; SD= standard deviation; ADL=Activities of daily living; IADL=Instrumental activities of daily living

Note: Percentages may not add to 100 due to rounding

Table 2

Symptom prevalence and ED utilization in 403 participants over 15 months (N=5641 interviews or person-months of follow-up).

	Total	ED Utilization	No ED Utilization	p-value
Pain	1046/5352 (19.5%)	44/134 (32.8%)	1002/5218 (19.2%)	<.000 ^{*†}
Tired	676/5358 (12.6%)	25/135 (18.5%)	651/5223 (12.4%)	0.048 ^{*†}
Nausea	17/5367 (0.3%)	1/135 (0.7%)	16/5232 (0.3%)	0.352 [§]
Depressed	125/5368 (2.3%)	4/136 (2.9%)	121/5232 (2.3%)	0.557 [§]
Anxious	44/5368 (0.8%)	2/138 (1.4%)	42/5230 (0.8%)	0.304 [§]
Sleepy	76/5365 (1.4%)	3/135 (2.2%)	73/5230 (1.4%)	0.441 [§]
Lack of appetite	99/5365 (1.8%)	4/136 (2.9%)	95/5229 (1.8%)	0.316 [§]
Shortness of breath	466/5365 (8.6%)	20/135 (14.8%)	446/5230 (8.5%)	0.019 ^{*†}
Fair or poor well-being	1014/5368 (18.8%)	44/135 (32.5%)	970/5233 (18.5%)	0.000 ^{*†}

[†] Chi-squared test;

[§] Fisher's exact test;

^{*} Denotes p<.001; "total" column is the sum of ED utilization, and no ED utilization

Table 3

Generalized linear model predicting ED utilization over 15 months of follow-up (N=403)

	Model 1			Model 2			Model 3		
	Odds Ratio (95% CI)	Odds Ratio (95% CI)	Odds Ratio (95% CI)	Odds Ratio (95% CI)	Odds Ratio (95% CI)	Odds Ratio (95% CI)	Odds Ratio (95% CI)	Odds Ratio (95% CI)	
Age at follow-up interview	0.9705 (0.9250, 1.0185)	0.9691 (0.9215, 1.0191)	0.9725 (0.9302, 1.0168)	0.9778 (0.9311, 1.0269)	0.9706 (0.9250, 1.0186)	0.9726 (0.9249, 1.0228)	0.9647 (0.9189, 1.0129)		
Race, African American	0.7337 (0.7669, 2.4220)	0.7294 (0.7727, 2.4320)	0.7320 (0.7592, 2.4584)	0.6890 (0.7965, 2.6443)	0.7714 (0.7251, 2.3178)	0.6351 (0.8674, 2.8582)	0.7126 (0.7693, 2.5600)		
Sex, female	0.8720 (0.6413, 2.0509)	0.8950 (0.6215, 2.0085)	0.8875 (0.6244, 2.0336)	0.8168 (0.6588, 2.2750)	0.8586 (0.6409, 2.1164)	0.7774 (0.7003, 2.3629)	0.8710 (0.6294, 2.0943)		
Non-urban residence	0.7455 (0.7972, 2.2567)	0.7632 (0.7780, 2.2065)	0.7769 (0.7465, 2.2195)	0.8209 (0.7085, 2.0947)	1.2714 (0.7389, 2.1874)	0.7825 (0.7311, 2.2333)	0.7684 (0.7547, 2.2443)		
6 th grade education	1.9334 (0.1714, 1.5606)	1.8780 (0.1768, 1.6038)	1.8656 (0.1752, 1.6398)	0.3659 (0.1002, 1.3355)	2.0945 (0.1553, 1.4683)	2.6765 (0.1023, 1.3645)	1.8007 (0.1910, 1.6149)		
Income <\$12,000	0.7755 (0.7067, 2.3528)	0.7429 (0.7375, 2.4571)	0.7419 (0.7168, 2.5340)	0.8271 (0.6241, 2.3422)	0.7664 (0.7027, 2.4232)	0.8426 (0.6126, 2.2993)	0.7769 (0.6702, 2.4719)		
Married	0.7099 (0.3821, 1.3188)	0.7022 (0.3755, 1.3128)	0.7157 (0.3808, 1.3454)	0.6131 (0.3222, 1.1665)	0.7065 (0.3784, 1.3192)	0.6177 (0.3203, 1.1910)	0.7168 (0.3848, 1.3354)		
Charlson comorbidity score	0.9905 (0.8347, 1.1755)	1.0167 (0.8479, 1.2192)	1.0133 (0.8379, 1.2252)	1.0786 (0.8833, 1.3171)	1.0118 (0.8339, 1.2275)	1.0516 (0.8633, 1.2808)	0.9651 (0.7992, 1.1656)		
Number of medications	0.9269 (0.8633, 0.9951)	0.9303 (0.8635, 1.0024)	0.9334 (0.8655, 1.0066)	0.9404 (0.8662, 1.0210)	0.9395 (0.8697, 1.0149)	0.9406 (0.8704, 1.0165)	0.9526 (0.8833, 1.0274)		
ADL score	0.8094 (0.6755, 0.9699)	0.8812 (0.7089, 1.0954)	0.8867 (0.7111, 1.1058)	0.9093 (0.7101, 1.1644)	0.9398 (0.7264, 1.2159)	0.8340 (0.6775, 1.0266)	0.8555 (0.6896, 1.0612)		
IADL score	1.0728 (0.8618, 1.3355)	1.0909 (0.8736, 1.3622)	1.1174 (0.8848, 1.4113)	1.0554 (0.8433, 1.3208)	1.1138 (0.8944, 1.3871)	1.0347 (0.8186, 1.3077)	1.1234 (0.8818, 1.4312)		
ESAS total score		0.8570 (0.7024, 1.0455)							
BSS total score				0.8501 (0.7138, 1.0125)		0.9558 (0.8210, 1.1127)			
CMSAS total score									
Pain			0.7952 (0.4479, 1.4120)		1.0186 (0.5758, 1.8018)		0.6976 (0.4039, 1.2048)		
Tired			0.7065 (0.7588, 2.6408)		0.9290 (0.5749, 2.0156)				
Nausea			0.8341 (0.2398, 5.9948)				0.7990 (0.2869, 5.4597)		
Depressed			1.8147 (0.2020, 1.5038)						
Anxious			0.3935 (0.7550, 8.5532)		0.4290 (0.6769, 8.0245)				
Sleepy			1.9505 (0.2009, 1.3081)				1.7754 (0.1927, 1.6464)		
Lack of appetite			0.6705 (0.5855, 3.7985)		0.7727 (0.5135, 3.2612)		0.6908 (0.5175, 4.0495)		
Shortness of breath			0.8875 (0.5911, 2.1479)		0.9363 (0.5867, 1.9439)		0.8861 (0.5893, 2.1611)		
Fair or poor well-being			0.5436 (1.0326, 3.2769)		0.3313 (0.1655, 0.6631)				
Problems with balance					1.0817 (0.3824, 2.2351)				
Leg Weakness					1.1749 (0.5815, 2.3738)		1.2399 (0.6161, 2.4955)		
Constipation									

	Model 1			Model 2			Model 3		
	Odds Ratio (95% CI)	Odds Ratio (95% CI)	Odds Ratio (95% CI)	Odds Ratio (95% CI)	Odds Ratio (95% CI)	Odds Ratio (95% CI)	Odds Ratio (95% CI)	Odds Ratio (95% CI)	
Stiffness						0.6948 (0.6887, 3.0081)			
Anhedonia						1.8324 (0.2127, 1.4000)		0.5926 (0.9035, 3.1522)	
Lack of energy								1.1171 (0.5080, 2.4567)	
Difficulty sleeping								0.4596 (0.2014, 1.0489)	
Dry mouth								1.6030 (0.1657, 2.3486)	
Weight loss								1.2721 (0.2645, 2.3364)	
Sad								0.8308 (0.2720, 2.5368)	
Worrying								1.3342 (0.1660,3.3838)	
Nervous								1.2847 (0.4190, 3.9393)	
Problems with concentration									

P Values < 0.05 are shown in **bold**

ED=Emergency Department; ADL=Activities of daily living; IADL=Instrumental activities of daily living; ESAS=Edmonton Symptom Assessment Scale; BSS=Brief Symptom Screen; CMSAS=Condensed Memorial Symptom Assessment Scale