The Relationship of Home Range to Functional Status and Cognitive Status of Frail Elders

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SUMMARY. Age related declines and chronic illness factors can limit or restrict the independent functioning of the elderly, especially performing such activities as traveling to visit a friend or family member, shopping, worshipping outside the home, or vacationing. To explore the relationship between traveling outside the home, which we call home range, and functional status and cognitive status, 616 older persons with disabilities from Western New York answered questions about places they visit each week and the frequency of their visits. They were also asked what places they would like to go, but don't, and why they don't go to those places. Home range was operationalized as the number of miles traveled, the number of places visited, and the number of trips taken in a typical week. We found a relationship of physical status to home range, but no relationship was found for cognitive status. Places

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the elderly report they would like to go but don't included leisure and social activities, shopping, traveling long distances, and worshipping. Reasons the elderly report they are unable to get out of the home include difficulty obtaining transportation, health factors, lack of companionship, and accessibility. *[Article copies available for a fee from The Haworth Document Delivery Service: 1-800-HAWORTH. E-mail address: <docdelivery@ haworthpress.com> Website: <http://www.HaworthPress.com> © 2005 by The Haworth Press, Inc. All rights reserved.]*

INTRODUCTION

The ability to get to places outside of the home is an integral component for older persons to socialization, physical fitness, as well as a sense of control and well-being. Age related declines and chronic illnesses can limit or restrict the independent functioning of the elderly, especially performing such activities as traveling to visit a friend or family member, shopping, worshipping outside of the home, or vacationing. Performance of instrumental activities of daily living (IADLs) requires a higher level of cognitive and physical functioning than activities of daily living (ADL's), and more elders have difficulty with IADLs than with ADLs, such as dressing, eating or toileting (Marottoli, de Leon, Glass, Williams, Cooney, & Berkman, 2000; Njegovan, Hing, Mitchell, & Molnar, 2001; Waters, Allsopp, Davidson, & Dennis, 2001). Few studies of the elderly have focused on issues relating to getting to places outside the home, such as changes in places they visit, distances they travel, or the difficulties and limitations that may be related to such changes. The present study explored the concept of home range operationalized by distance traveled per week, number of different places visited per week, and number of trips taken per week.

REVIEW OF LITERATURE

Several studies suggest that the elderly desire engagement in activities (Bowling, 1996; Lilja & Borrell, 1997). Lilja and Borrell's report focused on the elderly's desire to remain independent in such activities as shopping, maintaining social contacts, and continuing to pursue hob-

bies, and the environmental restrictions they encountered. Bowling interviewed 2,031 elders to determine how quality of life is impacted by illness. Individuals with longstanding illnesses reported the importance of getting out and about, walking, shopping, working, maintaining a social life, and having leisure activities.

Difficulties in maintaining independence in out-of-home activities can be the result of physical impairments which impact walking ability, including speed and stair climbing, and visual functioning, or cognitive impairments which often lead to a decline in driving ability (Marottoli et al., 2000; Brayne, Dufouil, Ahmed, Dening, Chi, McGee, & Huppert, 2000; Sonn, Frandin, & Grimby, 1995; Stutts, 1998). Njegovan et al. (2001) studied 5,874 community-dwelling individuals aged 65 years and older from the Canadian Study of Health and Aging I and II. They found that declines in cognitive status were directly correlated with loss of independence in IADLs, and that IADL independence was lost at higher cognitive scores on the Modified Mini-Mental State Examination than loss of basic ADLs. Stutts (1998) concluded that cognitive impairments, which affect one's memory, attention, information processing, and rapid decision making, are more likely to reduce annual miles driven than are visual impairments. Taylor and Tripodes (2001) focused on driving cessation by the elderly with dementia. When individuals with disabilities like dementia lost the license to drive, alternative strategies such as walking, use of public transportation, or van services did not increase. This may be due to the physical, visual, and cognitive requirements necessary for advanced scheduling, locating, and boarding buses or vans and economic restrictions. Avoidance of high risk driving situations, such as poor weather conditions, high-speed roads, or driving after dark, may also affect distances traveled and places visited by the elderly. Even though the ability and desire to maintain independence in traveling is present, personal circumstances such as financial limitations, distance to a particular place, or fear of the use of public transportation also limits home range of the elderly (Czaja, Weber, & Nair, 1993; Rittner & Kirk, 1995).

Gender also appears to have an impact on mobility, driving, distances traveled, and the use of public transportation. In a longitudinal study by Ahacic, Parker and Thorslund (2000), which looked at mobility limitations based on age, gender and social class, women above the age of 55 years were initially more likely to report limitations in the ability to run, walk, or use stairs than men, but this gender differential decreased by the age of 70 to 75 years. An increase in age and being female is strongly associated with driving cessation (Collia, Sharp, & Giesbrecht, 2003).

The Transportation Research Board (1999), in a report that investigated the safety and mobility patterns of older women, stated that the percentage of older women who retain their driver's license privileges continues to be lower than their male equivalents. Gallo, Rebok, and Lesikar (1999) concluded from a survey that women were more likely to report having changed or adapted their driving habits based on physical or cognitive decline. While men are more likely than women to request assistance for such activities as housekeeping or cooking, women are more likely to request assistance for such tasks as shopping and getting around outside of the home (Bootsma-van der Wiel, Gussekloo, de Craen, van Exel, Knook, Lagaay, & Westendorp, 2001; Sonn, Grimby, & Svanborg, 1996). Hopp's (1999) study determined that residents living in board and care homes who were white, female and had more frequent family contact were more likely to receive assistance from family members, friends and other informal helpers to meet such IADL needs as shopping and getting around outside.

The ability to drive oneself to a chosen destination appears to be the preferred mode of transportation (Collia et al., 2003). We are more likely to limit participation in certain activities, especially social or leisure activities, if assistance getting there is required (Stowell Ritter, Straight, & Evans, 2002; Gignac, Cott, & Badley, 2000). As people age, and functional status and/or cognitive status decreases, they depend more on external support. Support services for the elderly, such as public transit, taxis, or van services, as well as rides from family members and friends, offer alternative modes of transportation when physical mobility or driving is restricted. Yet, many older persons reside in suburbs, small towns or rural areas, which typically have limited public transportation services (Beverly Foundation, 2004; Collia et al., 2003; Rittner & Kirk, 1995). Difficulty accessing public transportation and fear of becoming victims of crime while using public transportation have been reported as factors for nonuse of services available (Gignac et al., 2000). Taylor (2001) found that many non-drivers have difficulty accessing the services they require, or finding rides from family members or friends, especially when destinations were more social or recreational in nature. In the 2001 National Household Travel Survey, the U.S. Department of Transportation reported that on the average nondrivers make approximately three trips outside of the home per week, while drivers leave their homes about eight times per week.

Several studies demonstrated a hierarchical relationship between IADLs and disability over time (Njegovan et al., 2001; Whittle & Goldenberg, 1996). Barberger-Gateau, Rainville, Letenneur, and Darti-

gues (2000) conducted a longitudinal study of 3,751 older persons with follow-up at three and five years. They found an increase in disability and dependence in ADLs, IADLs, and mobility over time. Driving cessation and changes in miles driven are related to physical and mental ability and age (Marottoli et al., 2000; Brayne et al., 2000). Miller, Rejeski, Reboussin, Te-Have, and Ettinger (2000), in their analysis of physical activity and disability in older adults, reported that the ability to maintain higher levels of physical fitness and mental functioning was associated with independence in IADLs, such as walking, stair climbing, and shopping over time.

Continued mobility and the capacity to "get out" is closely related to physical and social activity, and is essential to maintain community and family contacts, feelings of independence, and increased satisfaction with one's quality of life. As quality of life is often measured by degree of loneliness, and frequency of social contact or social activity, limitations in the ability to "get out" may directly affect one's perceived satisfaction with life. When one engages in the physical act of going from place to place, an increase in physical and social activity occurs. Physical activity can reduce the progression of disability and depression in older adults, possibly prolonging independent living (Miller et al., 2000; Marottoli, de Leon, Glass, Williams, Cooney, Berkman, & Tinetti, 1997). As the functional and/or cognitive status of the elderly diminishes, home range is more likely to contract. Places and the people they visit, reasons for getting out of the house, and distances traveled may be affected by the physical and mental limitations they encounter. Based on a 10-year longitudinal study of the Rehabilitation Engineering Research Center (RERC) on Aging called the Consumer Assessments Study (CAS), the present study addresses several components related to elders' getting out beyond the home, including an exploration of places they visit and would like to visit, distances traveled, reasons for decreases in distances traveled, gender differences, and changes over time. This analysis relates home range to the functional status and cognitive status of the frail elderly. The term frail elders refers to individuals who experience difficulty with at least one ADL and have underlying chronic conditions.

METHODS

Sample. From 1991 to 2001, 26 senior service agencies and hospital rehabilitation programs referred to the CAS individuals they currently

served, or in the case of hospital rehabilitation programs, individuals discharged home. A comparison of initial interviews of the CAS sample with the 1986 National Health Interview Survey and the 1987 National Medical Expenditure Survey (Mann, Hurren, Tomita, & Charvat, 1997) reported that the CAS sample closely resembled the approximately eight to 12 percent of the elder population who have difficulty with at least one ADL or IADL. The CAS was initiated in Western New York (WNY) where 789 elders were interviewed. We did follow-up interviews annually on the WNY sample. For the present report, we utilized initial interviews of participants who completed the home range section of the assessment (n = 616).

Demographic information on the research sample (n = 616) is presented in Table 1. Subjects ranged in age from 60 to 98 years, with a mean of 73.71 years. Four hundred thirty-nine (71.2%) of these subjects were female, and 503 (82.2%) were white. Two hundred thirty-eight (39.0%) had completed high school. Two hundred ten (34.0%) of the subjects were married, 334 (54.4%) lived alone, and 334 (54.2%) owned their own home. Two hundred fifty-seven (42.8%) of the sample had incomes under $10,000 per year. Table 2 presents information on measures of health, functional and psychosocial status for year 1. Participants averaged 5.76 visits to a physician, and 1.93 days hospitalized, during the six months prior to the study interview. They were taking on average 4.74 medications daily, and had a mean of 6.23 chronic diseases or conditions. Sixteen and one-half percent reported poor vision or were blind, and just over one-third reported less than "good" hearing. On average, study participants were 25.6 percent physically disabled (Sickness Impact Profile score). Participants scored a mean of 9.56 out of 14 for IADLs, and 77.12 out of 91 on FIM motor. Subjects' mean MMSE score is 27.91; 24 is typically the cutoff point for separating samples into cognitively and noncognitively impaired (Folstein, Folstein, & McHugh, 1988).

Instruments

The CAS uses a battery of instruments to measure multiple dimensions including instruments developed by other investigators, and instruments developed to meet the unique requirements of this study. The Consumer Assessments Study Interview Battery (CAS-IB) contains several parts from the Older Americans Research and Service Center Instrument (OARS) including: Physical Health Scales, Instrumental Activities of Daily Living Scale, and Social Resources Scale

TABLE 1. Demographic Information (n = 616)

Age	Mean = 73.71/SD = 7.74
Sex	
Male	177 (28.8%)
Female	439 (71.2%)
Race	
Black	104 (17.0%)
White	503 (82.2%)
Hispanic	2 (0.3%)
Asian	1 (0.2%)
Native American	1 (0.2%)
Other	5 (0.9%)
Education (n = 610)	
Grade School	23 (3.8%)
Middle School	126 (20.7%)
High School	238 (39.0%)
Some College	137 (22.5%)
Bachelors Degree	47 (7.7%)
Masters Degree	28 (4.6%)
Doctorate	11 (1.8%)
Marital Status	
Married	210 (34.0%)
Widowed	287 (46.7%)
Divorced	52 (8.5%)
Single	58 (9.4%)
Other	9 (1.5%)
Housing Status	
Own	334 (54.2%)
Rent	238 (38.6%)
Other	44 (7.1%)
Living Status (n = 614)	
Live alone	334 (54.4%)
Live with someone	238 (45.6%)
Annual Income (n = 590)	
Less than $5,000	63 (10.7%)
$5,000-$9,999	194 (32.1%)
$10,000-$14,999	111 (18.0%)
$15,000-$19,999	74 (12.5%)
$20,000-$29,999	79 (13.4%)
$30,000-$39,999	29 (4.9%)
$40,000 and above	45 (7.6%)

TABLE 2. Health, Functional and Psychosocial Status (n = 616)

HEALTH	
<u>**Number of times seen a doctor in the past 6 months**</u>	Mean 5.76/SD = 6.12
<u>**Number of sick days in the past 6 months**</u>	
None	360 (58.5%)
A week or less	100 (16.3%)
More than a week, but less than a month	81 (13.5%)
1-3 months	51 (8.3%)
4-6 months	19 (3.1%)
<u>**Number of days in a hospital**</u>	Mean = 1.93/SD = 5.95
<u>**Number of medications**</u>	Mean = 4.74/SD = 3.31
<u>**Number of chronic illnesses**</u>	Mean = 6.23/SD = 3.14
<u>**Vision**</u>	
Excellent/Good	370 (60.1%)
Fair	144 (23.4%)
Poor	90 (14.6%)
Totally Blind	12 (1.9%)
<u>**Hearing**</u>	
Excellent/Good	397 (64.5%)
Fair	142 (23.1%)
Poor	65 (10.6%)
Totally Deaf	11 (1.8%)
<u>**Physical Disability (SIP, % disability)**</u>	Mean = 25.60/SD = 14.73
<u>**FUNCTIONAL STATUS**</u>	
IADL-OARS (0-14)	Mean = 9.56/SD = 3.84
<u>**FIM:**</u>	
Motor	Mean = 77.12/SD = 11.65
Cognitive	Mean = 31.78/SD = 6.44
FIM Total	Mean = 108.77/SD = 16.14
PSYCHOSOCIAL STATUS	
Mental State–MMSE (0-30)	Mean = 27.91/SD = 2.68
Self-Esteem–Rosenberg (10-40)	Mean = 32.96/SD = 5.09
Depression–CESD (0-60)	Mean = 11.78/SD = 10.50
Quality of Life	Mean = 2.25/SD = .88
Satisfaction with Life	Mean = 2.96/SD = .95

(Fillenbaum, 1988). A summary of the instruments included in the CAS Interview Battery is presented in Table 3.

Sections of the CAS-IB Related to Home Range. The CAS-IB asks study participants: *Please list all the places you usually visit during a typical week and how frequently you would visit each place.* On a street map, the interviewer asked the participant to mark the places he or she usually went during a typical week. From the frequency, and distance to place visited, we calculated Total Distance Traveled in a Typical Week, which we use as Home Range. Participants were also asked if there are any places they would like to go that they don't get to, and why.

Health Status Instruments. The Physical Health Scales on the OARS include: number of physician visits in the past six months; number of in-patient hospital days; number of medications taken; and number and types of chronic illnesses. Study participants are asked which of 38 illnesses they have, and the extent to which each illness interferes with activities. The Functional Status Index (FSI) consists of 10 items within three sections (gross mobility, hand activities, and personal care) scored on a four point scale from 1 = no pain to 4 = severe pain. The item scores are summed for a total score. The minimum possible score is 10; the maximum score (severe pain on every item) is 40. The reliability and validity of the FSI have been examined and found to be adequate (Fricke, Unsworth, & Worrell, 1993).

To determine chronic diseases and conditions, subjects were asked: "*Do you have any of the following illnesses at the present time?,*" "*Indicate how long this impairment has limited your activity,*" and "*How much does it interfere with your activities?*" Table 4 reports chronic diseases and conditions grouped under major headings, as well as frequencies for each major category.

Functional Status Instruments. Three instruments are used to measure functional status: the IADL section of the OARS, the Sickness Impact Profile (SIP) (Gilson, Gilson, & Bergner, 1975), and the Functional Independence Measure (FIM). These instruments are moderately correlated with each other and there is some overlap in content such as mobility. There are, however, substantial conceptual and structural differences in these measures.

OARS IADL Instrument. The total IADL score is calculated by summing together the scores on the seven items from the IADL section of the OARS. The seven items ask whether or not the study participant can use the telephone, get to places out of walking distance, go shopping, prepare meals, do housework, take medicine, and handle money. Responses are scored: 2 = without help, 1 = some help, 0 = completely un-

TABLE 3. Instruments in the Consumer Assessments Study Interview Battery

DIMENSION	*INSTRUMENT(S)*	*DEVELOPED BY*
Demographic Information	1. Older Americans Research & Service Center Instrument (OARs)	1. *Duke University
	2. Rehabilitation Engineering Research Center (RERC)- Aging Demographic Survey	2. **RERC-Aging
Health Status		
Physical Health	OARs	Duke University
Pain	Functional Status Index-Modified	A. Jette
Impairment Status		
Vision and Hearing	OARs	Duke University
Cognition	Mini-Mental Status Examination	M. Folstein, S. Folstein, P. McHugh
Motor	Sickness Impact Profile	B. Gilson et al.
Functional Status		
Instrumental Activities of Daily Living	OARs	Duke University
Functional Independence	FIM	C. Granger
Psychosocial Status		
Depression	Center for Epidemiological Studies Depression Scale (CESD)	L. Radloff
Self-Esteem	Rosenberg Self-Esteem Scale	R. Rosenberg
Assistive Technology	Assistive Technology Used	RERC-Aging
Home Environment	Home Environment Survey	RERC-Aging

*Duke University Center for the Study of Aging and Human Development
**Rehabilitation Engineering Center on Aging

TABLE 4. Chronic Diseases and Conditions (n = 616)

Heart Disease (n = 509/82.6%)	High Blood Pressure Circulation difficulties in arms or legs Heart trouble Anemia
Lung Disease (n = 161/26.2%)	Asthma Emphysema Chronic Obstructive Pulmonary Disease Tuberculosis Other Respiratory Disorders (e.g., pneumonia)
Musculoskeletal Disorders (n = 513/83.3%)	Arthritis Hip or knee fracture/replacement Effects of Polio Cerebral Palsy Muscular Dystrophy Degenerative vertebral disc problems Shoulder dislocation/replacement Other Disorders (e.g., torn ligaments)
Urinary Disease (n = 221/35.8%)	Kidney Disease Other urinary tract disorders
Eye Disease (n = 332/53.9%)	Glaucoma Cataracts Macular Degeneration Other Impairments (e.g., trauma, retinitis)
Glandular Disorders (n = 237/38.5%)	Diabetes Other Thyroid Disorder
Stomach/Intestinal Disorders (n = 217/35.2%)	Ulcers Liver Disease Other
Nervous System Disorders (n = 258/41.9%)	Brain Disorder (e.g., tumor, TIA) Peripheral Nerve Disorder Alzheimer's and other dementia related diseases Multiple Sclerosis Epilepsy Parkinson's Disease Effects of Stroke Other (e.g., multi-infarct)
Other (n = 430/69.8%)	Cancer or Leukemia Affective/Anxiety Disorder Skin Disorders Hearing Problems Speech Impairment/Impediment Foot Problems Lupus Vertigo, etc.

able or no answer. The IADL score can range from 14, totally independent, to 0, totally dependent.

Sickness Impact Profile (SIP)–Physical Dysfunction Section, was used to determine percent of physical disability for study participants. Three sections of the SIP, with a total of 45 separate items, are used to calculate the percent of physical disability score; these sections are Body Care and Movement, Mobility, and Ambulation.

Functional Independence Measure (FIM). The FIM was developed as an instrument to determine the severity of disability. The FIM consists of 18 items, each with a maximum score of 7, and a minimum score of 1. Thus, the highest possible total score is 126, and the lowest, 18. Each level of scoring (1 through 7) is defined; for example 7 = "complete independence," 3 = "moderate assistance." The FIM measures the following areas: Self-Care, Sphincter Control, Transfers, Locomotion, Communication, Social Cognition. The FIM has been found to be reliable and valid, even with subjects over 80 years of age (Pollak, Rheult, & Stoecker, 1996).

Mental Status and Psychosocial Status Instruments

Mini Mental Status Exam (MMSE). The MMSE consists of 11 items that are summed to create a mental status score. The MMSE score ranges from a maximum score of 30 to a minimum score of 0. Scores less than 24 are considered indicative of cognitive impairment.

Rosenberg Self-Esteem Scale. This scale consists of 10 items. Responses for each item are measured on a four-point Likert scale (1 = strongly disagree through 4 = strongly agree). The self-esteem score ranges from 40 (high self-esteem) to 10 (low self-esteem) (Rosenberg, 1965).

Center for Epidemiological Studies Depression Scale (CESD). The CESD consists of 20 items asking study participants to describe how they felt during the past week. For example, one item states: "I had trouble keeping my mind on what I was doing." Responses are measured on a four-point scale (0 = less than once a day; 1 = some of the time–2 days a week; 2 = moderately–3-4 days a week; 3 = mostly–5-7 days a week). Scores range from 0 to 60 with the higher the score the more depressed. Typically, a score of 16 or higher is considered indicative of depression (Radloff & Locke, 1986).

Social Resources Scale. Using a section of the OARS, study participants are asked eight questions regarding contact with friends and relatives and feelings of loneliness. The responses are entered into a formula

to calculate an overall social resources score; the lower the number the more social resources available.

Quality of Life Scale. The Quality of Life Scale (QOL) asks study participants how the quality of their life has been during the past four weeks, with responses on a five-point scale (1 = very good; 2 = pretty good; 3 = good and bad parts about equal; 4 = pretty bad; 5 = very bad: could hardly be worse).

Satisfaction Scale. The Satisfaction scale asks study participants how satisfied are you with life in general, with responses on a four-point scale (4 = very satisfied; 3 = fairly well satisfied; 2 = more satisfied than not; 1 = not satisfied).

Data Collection

All data were collected in face-to face interviews in study participants' homes by nurse or occupational therapist interviewers. Interview time averaged about 2.5 hours. Appointments were scheduled at times convenient for study participants to ensure that they would be rested, comfortable, and not feel rushed.

ANALYSIS

Descriptive statistics were used to report sample characteristics (Tables 1 and 2). All analyses were completed using SPSS version 11.0.

The analysis used for each research question is described below:

1. For the questions: *What is the relationship of functional status to home range?* and *What is the relationship of cognitive status to home range?* Correlational analysis was used.
2. For the questions: *What places do frail elders report that they go? What places do frail elders report that they would like to go, but don't? What are the reasons for not going?* We report frequencies of responses for places visited, and frequencies of responses for places not visited and reasons for not going. Many of those interviewed reported more than one place they visit, would like to visit, but don't, as well as more than one reason for not going.

Data for places frail elders report that they go or would like to go, but don't, are organized into the following categories: IADLs, Leisure, Medical/ Health, School, Social/Visiting, Travel, Work/Volunteer, and Worship.

Table 5 presents a breakdown of each of these categories based on participants' report of places they go or would like to go. Reasons frail elders report for not going are organized into the following eight categories: Accessibility, Companionship, Cost, Health, Mobility, Safety, Transportation, and Weather. Table 6 presents a breakdown of each of these categories based on participants' report of reasons they don't go places. Many of those interviewed reported more than one place they would like to visit, but don't, as well as more than one reason for not going.

TABLE 5. Places Elders Report They Go or Would Like to Go

Categories	Places
IADL	Bank, hair salon, grocery store, other shopping
Leisure	Fishing, bowling, horseback riding, playing cards, library, museum, craft show, restaurant, movie and theatre, etc.
Medical/Health	Doctor, dentist, therapy, exercise class, support group
School	High school and college courses to complete or enhance education
Social/Visiting	Visiting family and friends, holiday gathering, club meeting
Travel	Vacation
Work/Volunteer	Work for pay or volunteer-related service
Worship	Church, bible study

TABLE 6. Reasons Reported for Not Going Places

Categories	Reasons
Accessibility	Building inaccessibility (lack of ramps, no elevators, stairs), inaccessible bathrooms, chairs and tables not sturdy enough to assist with transfers, lack of grab bars, difficulty managing heavy doors, insufficient handicap parking places, homes inaccessible because of furniture/bathrooms
Companionship	Family member or caregiver too busy, burden on family, no one to accompany or supervise the outing, caregiver has other obligations, uncomfortable going alone, need assistance to manage wheelchair, etc.
Cost	No affordable transportation available, trip too expensive, low fixed income and financial constraints, gas for automobile too expensive, cabs cost too much
Health	Too tiring or fatiguing, shortness of breath, vision and hearing impairments, oxygen needs, cardiac difficulties, concerns about iliostomy bag, disorientation, seizures, special diet and health needs, general poor state of health
Mobility	Inability to manage stairs, stairs too high, unable to ambulate well, too painful to walk, concerns about amount of walking necessary, difficulty managing wheelchair, not enough curb cuts to manage scooter, difficulty managing walker on stairs
Safety	Fear of driving alone or at night, fear of neighborhood, afraid of going places alone, afraid to take a cab or get on a bus, fear of heavy traffic at intersections, fear of falling
Transportation	Lack of transportation, public transportation too cumbersome with wheelchair, difficulty using public transportation, too uncomfortable sitting on bus for long periods, no transportation available that provides assistance, unable to find reliable transportation, unable to access transportation due to cognitive difficulties
Weather	Concerns about poor weather conditions, i.e., rain, snow, cold temperatures

RESULTS

Relative to question 1, which looked at responses from the initial interview of frail elders regarding home range, we utilized correlational analysis to describe the relationship between distances traveled, number of places visited, and number of trips taken and physical and mental status. Correlation coefficients were computed for each functional and mental assessment (independent variable) with home range per week (dependent variable) to determine if a significant relationship exists.

Descriptive statistics are reported in Table 7A for the mean scores of the distances traveled per week, number of trips taken per week, and number of places visited per week. Also reported in Table 7B are the functional and mental assessments and correlations with alpha being significant at .05.

TABLE 7A. Descriptive Statistics for Distance Traveled, Places Visited, and Trips Taken Per Week (n = 616)

	Minimum	Maximum	Mean/SD
Distance	.06	407	22.04/31.08
Places Visited	1.00	14.00	3.65/2.11
Trips Taken	.25	28.00	5.41/4.26

TABLE 7B. Correlations–Home Range with Functional, Mental and Psychosocial Assessments (n = 616)

	Distance	# Places Visited	# Trips Taken
FIM Motor	.046 *	.0001 **	.0001 **
FIM Total		.0001 **	.000 **
Vision	.012 *	.000 **	.000 **
Hearing			
SIP	.000 **	.000 **	.000 **
Total Meds		.023 *	.001 **
IADL Total	.017 *	.0001 **	.000 **
MMSE			
CESD		.000 **	.001 **
Rosenberg	.041 *	.0004 **	.0001 **
QOL		.001 **	.021 *
Satisfaction		.002 **	.0002 **

**Correlation is significant at the 0.01 level (2-tailed)
 * Correlation is significant at the 0.05 level (2-tailed)

A positive correlation exists between the Functional Independent Measure–Motor, and distance traveled per week (p = .046), number of places visited per week (p = .000), and number of trips taken per week (p = .000). As scores on the FIM motor decrease, so does the ability or desire to leave the home. Based on the total FIM score (which includes the motor and cognitive scores), both number of places visited and number of trips taken per week correlate at p = .000. All areas of home range demonstrate a relationship with the Sickness Impact Profile (SIP) which, based on distance traveled, places visited and trips taken per week, correlates at p = .000. Within the functional measures, vision correlates with home range in distance traveled (p = .012), places visited (p = .000) and trips taken (p = .000), demonstrating that as vision decreases one is less likely to leave home and participate in shopping, leisure or social activities, or possibly even to worship. Number of total medications used correlates inversely with number of places visited and number of trips taken, therefore, as medication use increases, places visited and trips taken decreases (p = .023 and p = .001, respectively). In reviewing the mental status and psychosocial status instruments, the MMSE did not correlate with home range. The mean score of the MMSE (27.91) may easily explain this, as it does not appear there were many participants with serious cognitive deficits. Home range does appear to be correlated with such psychosocial assessments as the Rosenberg Self-Esteem scale, the CESD, the Quality of Life scale, and the Satisfaction scale (see Table 7). With the CESD, since a higher score indicates one is more depressed, there is a negative correlation in that as the CESD increases, home range decreases.

Question 2 utilized descriptive statistics for the frequencies of places frail elders report they typically go to in a week (Table 8). Subjects also reported places they would like to go, but don't, as well as the reasons they do not travel there (Table 8).

We found that more trips outside of the home are related to shopping or banking, and going to a restaurant or movie, and fewer trips are for medical needs, long-distance travel, school or work. Study participants reported the places they wish they could go but don't, with the largest percentages falling in the leisure (30%), IADL (22%), and social categories (19%). The reasons for not participating in these activities include: problems with transportation (34%), health (18%), lack of companionship or assistance (18%), and accessibility (12%).

TABLE 8. Descriptive Statistics for Places Frail Elders Report They Go (n = 616); They Would Like to Go, But Don't and Why They Don't Go (n = 97)

Where they go (n = 616)	Frequency	Where they want to go (n = 97)	Frequency	Why they don't go (n = 97)	Frequency
IADLs	456 (29%)	Leisure	76 (30%)	Transportation	114 (34%)
Leisure	303 (19%)	IADLs	54 (22%)	Health	61 (18%)
Social/Visiting	278 (17%)	Social/Visiting	47 (19%)	Companionship	60 (18%)
Worship	274 (17%)	Travel-long distance	23 (9%)	Accessibility	41 (12%)
Medical/Health	222 (14%)	Worship	23 (9%)	Cost	22 (7%)
Work/Volunteer	49 (3%)	Medical/Health	19 (7%)	Mobility-physical	19 (6%)
Travel-long distance	8 (0.6%)	Work/Volunteer	8 (3%)	Weather	13 (3%)
School	5 (0.4%)	School	1 (1%)	Safety	9 (2%)

DISCUSSION

In this study, home range was defined as the number of miles traveled, the number of places visited, and the number of trips taken in a typical week. We found that physical status affect's one's capacity to get out of the house, which impacts such endeavors as engagement in social and leisure activities, maintaining independence in home management, compliance with doctors' appointments, and even worshipping. It was evident from the elders interviewed that their underlying medical conditions influenced their ability to "get out of the house." A relationship was also found with several psychosocial assessments. These limitations in home range, especially when social in nature, may negatively impact quality of life.

The number of places visited and number of trips taken per week appeared to be severely impacted by declines in functional and psychosocial status, with statistical significance demonstrated with all study assessments. Cognitive status did not appear to impact home range negatively, although most study participants did not have cognitive impairment.

We found that as home range declines, self-esteem declines. As self-esteem is based on personal successes, expectations, and appraisal of oneself, individuals who must limit, or who no longer have the capacity to engage in, "out of home" activities, are likely to experience a decrease in self-esteem. In an effort to compensate for their limitations, these individuals may attempt to replace many "out of home" activities with activities that are more solitary in nature, and experience additional role losses and decreased life satisfaction (Lemon, Bengtson, & Peterson, 1972).

This study identified possible reasons for decline in mobility and "getting out" of the house. The major reasons reported were lack of transportation, companionship, health status, and accessibility concerns. This population requires the assistance of friends, family caregivers, and readily available community services. Good transportation alternatives are often unavailable.

The major limitation of this study was the use of self-reporting, especially in the accuracy and full reporting of distances traveled. Data may be unreported due to elders' inability to recall their mobility in a typical week, or their knowledge of how far they may have actually traveled.

Further research should consider looking at other areas in comparison to home range, such as whether one lives alone or with someone, whether one is independent in driving or not, and gender differences in home range.

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