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Late Life Function and Disability Instrument in African American Women: Function Component

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Abstract

Obesity, age, and comorbidity can lead to limitations in physical function, especially in middle aged, community-dwelling African American women. To determine the clinical implications of limitations in physical function, instruments that assess physical function need to be tested in this population. The purpose of this secondary analysis was to report the internal consistency and validity of the Physical Function component of the Late Life Function and Disability Instrument (LLFDI) in middle-aged, community-dwelling African American women. One hundred twenty-six community-dwelling African American women completed in 2006 the Physical Function component, the Physical Activity Scale for the Elderly (PASE), and the 6 Minute Walk Test (6MWT) at baseline. Results indicated Cronbach's alphas were excellent (all $>.92$) for the Physical Function component and the three subscales. The Physical Function component correlated directly with the PASE ($r = .37, p < .01$) and the 6MWT ($r = .36, p < .01$) but was inversely correlated with age ($r = -.42, p < .01$) and comorbidity ($r = -.35, p < .01$). However, obesity was not correlated ($r = -.11, p > .05$). A three-factor structure of the Physical Function component was confirmed. Thus, the Physical Function component was a reliable and valid measure to screen African American women who were at risk for function limitations. Future recommendations are discussed.

INTRODUCTION

Obesity is a serious health condition in the United States (U.S.) as approximately 65% of adults are overweight and 31% are obese (Centers for Disease Control 2009). Further, African American women have the highest prevalence as four out of five African American women are either overweight or obese (U. S. Department of Health and Human Services 2010). Obesity is associated with a greater risk of developing hypertension, stroke, heart disease, diabetes, and many cancers (USDHHS 2007), and these chronic conditions are also more prevalent in African American women (Muenning et al. 2006). In addition, obesity has been linked to limitations in physical function in adults over the age of 60 years (Hedley, Ogden, and Johnson 2004). Recent trends have suggested that obesity is becoming more prevalent in adults 60 years of age or less (Goldman et al. 2009), especially in “baby

boomers” (born 1946–1964) who report worse health because of obesity than older adults (Seeman et al. 2010). Further, obesity has a stronger association with physical function than age (Villareal, Apovian, and Kusner 2005) as obese, middle-aged adults have poorer physical function and evidence of functional limitations than older adults (Brach et al. 2004). The proportion of women with functional limitations is increasing, and African American women have higher rates of functional limitations than the general population of women (Rimmer et al. 2009). Thus, physical function needs to be assessed in middle aged, community-dwelling African American women.

Description of the Problem

The Physical Function component of the Late Life Function and Disability Instrument (LLFDI) is a comprehensive assessment of physical functioning because it measures an individual’s ability to perform gross and fine motor skills necessary to perform an assortment of activities relevant to living independently in the community (Haley et al. 2002). These activities include carrying, moving, manipulating objects, and maintaining and changing body positions that are needed to perform daily routines. However, obesity limits the ability to perform usual activities, such as walking, climbing, and handling objects that are expected for community-dwelling adults (Haley et al. 2002). The capability to carry out these activities are important for shopping, caretaking, domestic activities, errands, and occupational skills (Rikli and Jones 1998; Masse et al. 1998). Currently, functional limitations associated with obesity may be greater than in the past due to the earlier onset of obesity and thus longer lifetime exposure (Leveille, Wee, and Iezzoni 2005). Obesity-related limitations in physical function also contribute to poorer health outcomes and increased health care costs (Jenkins 2004). Thus, instruments that assess physical function need to be reliable and valid for use with African American women who have higher than average rates of obesity, obesity-related health conditions, and functional limitations than the general population to determine their clinical applications.

The Physical Function component assesses functional limitations through self-reported difficulty in performing physical activities consisting of three separate domains: Upper Extremity, Basic Lower Extremity, and Advanced Lower Extremity. These separate domains are subscales. Studies have reported reliability of the Physical Function component and the three subscales that ranged from .83–.96 in middle-aged (ages 45–64 years), community-dwelling adults with chronic health conditions (Hand et al. 2010) and .58–.85 in a sample of black and white older community-dwelling women, (ages 59–84 years), with a mean BMI of 28.6. (McAuley et al. 2005). The reliability of the short form version of the Physical Function component and three subscales ranged from .80–.83 in geriatric patients in a rehabilitation facility recovering from surgery with a mean age of 81.7 years and a mean BMI of 26.2 (Denkinger et al. 2009). The short form had 15 items that excluded some Advanced Lower Extremity items so the reliability should be interpreted with caution. The Physical Function component has correlated with performance-based measures of endurance, such as the 400-meter walk test ($r = .69$) in community-dwelling older adults (Sayers et al. 2004) and performance-based measures of gait speed, such as the 8-footwalk test ($r = -.52$) and 2-minute walk distance ($r = .53$) in middle-aged adults with chronic health conditions (Hand et al. 2010). Only one study reported the validity of the three subscales with a self-reported measure of physical activity, the Physical Activity Scale for the Elderly (Upper Extremity: $r = .23$, Lower Extremity: $r = .20$, and Advanced Lower Extremity: $r = .40$) and the 7-meter walk test (Upper Extremity: $r = -.22$, Lower Extremity: $r = -.43$, and Advanced Lower Extremity: $r = -.51$) (McAuley et al. 2005). To support the validity of the Physical Function component, this scale needs to be tested against performance-based measures in a sample of middle-aged, community-dwelling African American women.

Due to obesity, comorbidity, and functional limitations in those under age 60 years, the Physical Function component of the LLFDI could be a valuable tool to assess physical function in middle-aged, community-dwelling adults. In the United States, middle-aged is considered 35–65 years of age (U.S. Department of Commerce 2004). No study was found that reported the reliability and validity of the Physical Function component specifically in African American women. Thus, the present study aimed to: (a) report the internal consistency of the Physical Function component of the LLFDI and (b) the validity of the Physical Function component of the LLFDI to measure functional limitations in middle-aged, community-dwelling African American women.

METHODS

Sample and Setting

Data for these secondary analyses were from a larger longitudinal study that examined the effects of a culturally-specific dance intervention on lifestyle physical activity, functional capacity (Murrock and Gary 2008) and body fat and body mass index (BMI) (Murrock and Gary 2010) at baseline, 8 weeks, and 18 weeks. A convenience sample of 126 African American women was recruited in the fall of 2006 from two urban African American Baptist churches in a large metropolitan city in a Midwestern state. Eligible participants could enroll in the study if they were community-dwelling, volunteered to be in the study, and met the inclusion criteria of: (1) African American women, (2) 35 years of age and older, (3) ability to speak and read English, (4) membership in the church, (5) not currently engaged in an exercise program, and (6) having written medical clearance from their physicians to enroll in the study. Exclusion criteria included those women who verbalized participating in an exercise program 2–3 times per week or were confined to a wheelchair (Murrock and Gary 2008).

Procedures

After permission was obtained from the minister of each church, the study was announced from the pulpit and printed in the church bulletin at each church. Over a one-month recruitment period, 129 women responded to the announcements made from the pulpit or printed advertisement in the church bulletin and were screened by the principal investigator to insure they met the study criteria. After applying the study criteria, three of the 129 women were excluded from the study because the principal investigator found that two of these women were unable to obtain written medical clearance because they did not have a primary care physician and one woman's physician was out of the country on a medical mission. Thus, the final sample included 126 African American women, which exceeded the minimum number of 100 participants that is considered acceptable for reliability and validity testing (MacCallum et al. 1999). Only baseline measures of the Physical Function component were analyzed because the culturally-specific dance intervention was proposed to have a direct effect on lifestyle physical activity and functional capacity. Institutional Review Board (IRB) approval of the study protocol, and written informed consent from all 126 study participants was obtained prior to data collection.

Measures

Demographic data (age, marital status, education, income, enrollment in a physical activity program), comorbidity, the Physical Activity Scale for the Elderly (PASE), and LLFDI were assessed at baseline by self-report on an investigator-developed questionnaire for the larger longitudinal study (Murrock and Gary 2008). The participants self-reported age, marital status (single, married, divorced, separated, etc.), education (less than high school, high school, some college, etc.), income (less than \$10K, 10–20K, etc.), and if they were currently enrolled in a physical activity program (yes/no). Co-morbidity was measured using

the Charlson Scale, a weighted sum of co-morbid conditions that mirror the functional burden of illness conditions (Charlson et al. 1987). Co-morbid conditions included heart disease, peripheral vascular disease, stroke, shortness of breath, ulcers, diabetes, kidney disease, cancer, leukemia, liver disease, and immunodeficiency diseases. The Charlson Scale scores ranged from 0–7 as higher scores indicated greater comorbidity. Body mass index and the 6-minute walk test (6MWT) were assessed by members of the research team trained in the study protocol. The PASE and 6MWT were performance measures of physical function used to determine criterion-related validity of the Physical Function component.

Primary Measure—The Physical Function component of the LLFDI was a 32-item measure of difficulty in performing physical functional tasks (Haley et al. 2002). It contained three subscales: 7 items for upper extremity (arms and hands), 14 items for basic lower extremity (standing, stooping, and walking), and 11 items for advanced lower extremity (physical activity and endurance). Questions were phrased: “How much difficulty do you have doing a particular activity without the help of someone else and without the use of assistive devices?” for functional tasks such as walking several blocks (Advanced Lower Extremity), getting in and out of a car (Lower Extremity), and holding a full glass of water (Upper Extremity). Respondents chose their degree of difficulty in performing these tasks on a 5-point scale (1=cannot do, 2= quite a lot, 3=some, 4= a little, and 5= none) for each item (Haley et al. 2002). Prior to administration, participants were made aware of the factors that may influence difficulty in task performance, like pain, fatigue, fear, weakness, soreness, ailments, health conditions, and disabilities. Total scores for the Physical Function component and the three subscales were computed by summing the item scores to obtain raw scores. Raw scores were then transformed to scaled scores (0–100) based on a one-parameter Rasch model (Haley et al. 2002). Higher scores on the Physical Function component and each subscale indicated higher levels of physical function.

Validation Measure—The PASE was chosen to demonstrate criterion-related validity as it assessed household, family care, and occupational activities (Washburn et al. 1993). Even though it was developed for the elderly, the PASE was appropriate because these activities required the performance gross and fine motor skills of upper extremity activities, lower extremity activities, and advanced lower extremity activities relevant to the everyday lives of community-dwelling adults. Other physical activity instruments were not chosen as they focused on organized sports, conditioning exercises, and recreational activities, often leading to the misclassification of physical activity in African American women (Masse et al. 1998). The PASE was a 10-item scale that assessed physical activity (leisure, household, occupational, and volunteer activities) during the past 7-day time frame (Washburn et al. 1993). Leisure activities included walking, light, moderate, and strenuous sport and recreation, and muscle strengthening exercises. Frequency of leisure activity participation was assessed using a 4-point scale (0=never, 1=seldom (1–2 days/week), 2=sometimes (3–4 days/week), 3=often (5–7 days/week). Duration of physical activity was recorded as the amount of time spent on the activity in the past week (1= less than 1 hour, 2= 1–2 hours, 3= 2–4 hours, and 4= more than 4 hours). Household activities (light and heavy) consisted of lawn work/yard care, outdoor gardening, and caring for others and were recorded as 1=no and 2= yes responses; however, the frequency and duration of household activities was not assessed by this instrument. Occupational and volunteer activities were recorded (1=no, 2=yes), and average daily frequency was computed by dividing the number of hours worked in the past week by 7. The total PASE score was computed by multiplying the amount of time spent in each activity (hours/week) or participation (yes/no) in an activity by the empirically derived item weights. The item weights were summed to provide an estimate of an individual’s amount of physical activity. Higher PASE scores indicated greater physical activity and were sensitive to changes in physical activity behavior.

Validation Measure—The 6MWT was chosen to demonstrate criterion-related validity as it was a performance measure of lower extremity endurance. Endurance is important for walking over a long period of time, performing household tasks, or participating in community activities frequent among community-dwelling African American women. To assess endurance, participants walked as far as possible around a pre-measured area at their own pace for 6 minutes. The participants were informed that they could rest if necessary. The distance walked in 6 minutes was measured precisely in feet with a rolling measurement instrument (DigiRoller Plus II, Model 6425, Carson City, NV), and time was measured with a digital stopwatch. The 6MWT was a convenient, inexpensive, non-invasive, and easily administered test that provides reliable and practical measures of functional capacity that correlates with laboratory measures of oxygen uptake during submaximal exercise (Carter et al. 2003).

Data Analysis

The Predictive Analytics SoftWare (PASW, version 19.0) was used to conduct data analyses that consisted of computation of reliability estimation using Cronbach's alpha and factor analysis to assess construct validity of the Physical Function component. Reliability estimation for the overall Physical Function component and the three subscales was based on internal consistency reliability using Cronbach's alpha with an alpha coefficient of greater than or equal to .70 viewed as adequate (Nunnally and Bernstein 1994). Cronbach's alpha is sample specific as it is a measure of internal consistency for test responses from current participants (DeVon et al. 2007). To examine reliability further, inter-item correlations were evaluated as the coefficient should fall between .30 and .70 (Nunnally and Bernstein 1994).

Criterion-related validity was determined by assessing correlations with the two validation measures of PASE and 6MWT. Due to the influence that obesity, age, and comorbidity have on physical function, these variables were also included. Factor analysis was used to confirm the presence of the three previously identified factors by forcing the items onto three factors as described by Green and Salkind (2005), using principal axis factoring extraction with oblique rotation (Fabrigar et al. 1999). Factor loadings of .50 and greater were considered good (Nunnally and Bernstein 1994).

FINDINGS

The majority of this sample of 126 women were middle-aged as 73% were 35–65 years, and 27% were 66–82 years, with a mean age of 58.7 years ($SD = 11.0$; range 36–82 years). Forty-two percent were married; 30% had some college education; 25% reported household income of \$40,000–\$60,000 per year, and none were currently enrolled in a physical activity program. Mean BMI was 32.2 ($SD = 6.8$) and mean comorbidity score based on the Charlson scale was 0.84 ($SD = 1.4$) on a scale of 0–7 (Table 1). Mean scores for the Physical Function component were 69.8 ($SD = 15.0$), for Upper Extremity 86.1 ($SD = 15.8$), for Lower Extremity 81.3 ($SD = 17.6$), and for Advanced Lower Extremity 63.9 ($SD = 18.8$). For the validation measures, the mean scores were 165.9 ($SD = 76.9$) for the PASE and 1517.1 ($SD = 318.9$) for the 6MWT.

Reliability

Internal consistency was supported for the Physical Function component and the three subscales as Cronbach's alphas were: Physical Function = .97; Upper Extremity = .92; Lower Extremity = .96; and Advanced Lower Extremity = .94. The mean inter-item correlations for the Physical Function component was .53; Upper Extremity was .61; Lower Extremity was .64, and Advanced Lower Extremity was .58, falling within the acceptable range.

Validity

For criterion-related validity, the Physical Function component was significantly related to the PASE ($r = .37, p < .01$) and 6MWT ($r = .36, p < .01$). For the three subscales of physical function, Upper Extremity demonstrated a significant relationship with the PASE ($r = .28, p < .01$) and 6MWT ($r = .25, p < .01$); Lower Extremity showed a significant relationship with the PASE ($r = .30, p < .01$) and 6MWT ($r = .31, p < .01$); and Advanced Lower Extremity had a significant relationship with the PASE ($r = .38, p < .01$) and 6MWT ($r = .41, p < .01$). Significant inverse relationships were observed between the Physical Function component and its three subscales with age ($r = -.22$ to $-.46$) and comorbidity ($r = -.19$ to $-.35$), and none of the scales significantly correlated with BMI (Table 2).

Confirmatory factor analysis was examined by forcing the data onto three factors. For the 32-item Physical Function component, 25 items loaded on Factor 1, which accounted for 56% of the variance. Factor 1 items were mostly Lower and Upper Extremity. Twenty items loaded on Factor 2 and accounted for 11% of the variance. These items were mostly Advanced and Lower Extremity. For Factor 3, 8 items loaded, accounted for 4% of the variance, and were mostly Lower Extremity (See Table 3). Five items loaded on all three Factors (mostly Lower Extremity), eight items loaded on both Factors 1 and 2 (mostly Advanced Extremity), two items loaded on both Factors 1 and 3 (Lower and Upper Extremity), and one item loaded on Factors 2 and 3 (Advanced Extremity).

DISCUSSION

Reliability

The Physical Function component and subscales demonstrated excellent reliability in middle-aged, community-dwelling African American women. The Physical Function component measured each woman's ability to perform discreet physical tasks encountered in daily routines. Results demonstrated similar reliability scores compared to middle-aged adults with chronic health conditions (Physical Function=.96; Upper Extremity=.83; Lower Extremity=.93; and Advanced Lower Extremity=.95) (Hand et al. 2010) and better reliability than black and white older community-dwelling women (Physical Function=not reported; Upper Extremity=.58; Lower Extremity=.93; and Advanced Lower Extremity=.85) (McAuley et al. 2005). Further, the reliability scores were better than the geriatric patients who completed the short form version of the Physical Function component (Physical Function=not reported; Upper Extremity=.83; Lower Extremity=.81; and Advanced Lower Extremity=.80) since items like, "walking around one floor of your home" and "walking a mile, taking rests if necessary" were excluded (Denkinger et al. 2009). The acceptable inter-item correlations for the Physical Function component and subscales implies the instrument measured the construct of functional limitations in this sample of middle-aged, community-dwelling African American women, which was important for walking, climbing, reaching, lifting, and handling everyday objects.

Validity

The Physical Function component and subscales significantly correlated with the validation measures of PASE and 6MWT. However, the correlations were weak to moderate ranging from $r = .25$ to $.41$. Given that these measures assessed Lower Extremity and Advanced Lower Extremity activities, it is surprising that the strength of the correlations were not higher. However, it is not surprising that the strength of the correlations were weak correlations with the Upper Extremity activities. This is similar to the findings of a study that validated only the three subscales with PASE ($r = .20$ to $.40$) and a 7-meter walk test ($r = -.22$ to $-.51$) in a sample of black and white older community-dwelling women (McAuley et al. 2005). Thus, the Physical Function component and the three subscales appear to be

valid for assessing physical function demonstrated by significant associations with measures of physical activity (PASE) and endurance (6MWT). Obesity did not have an adverse relation to physical functioning in this sample of African American women with a mean BMI of 32.2. Having a BMI of >30 should have been negatively related to Advanced Lower Extremity activities (e.g., going up and down three flights of stairs, hiking, running, etc.). One explanation for the lack of relation could be that the participants may have avoided these activities by taking an elevator/escalator or did not engage in these activities at all. Obesity was also not related to Lower Extremity (stepping up and down from a curb, opening a heavy door, etc.) and Upper Extremity activities (unscrewing a lid, using utensils, etc.) because these activities were performed without difficulty, regardless of BMI. This finding is in contrast to McAuley et. al (2005) who reported significant inverse relationships between BMI and Advanced Lower Extremity ($r = -.43$) and Lower Extremity ($r = -.28$) but no significant relationship of BMI with Upper Extremity. For age and comorbidity, significantly weak to moderate inverse relationships were observed with the Physical Function component and its three subscales. This is important because the mean age of participants was 58.7 years, and 73% were considered middle-aged (35–65 years), implying that functional limitations was evident in this relatively young age group of African American women. This study adds to the literature as no prior study has included age and comorbidity to validate the Physical Function component, even though the literature suggests that age and comorbidity may be related to physical function and functional limitations in community-dwelling African American women (Brach et al. 2004; Rimmer et al. 2009).

Confirmatory factor analysis supported a three-factor structure. The results revealed that of the 25 items that loaded on Factor 1, 13 were Lower Extremity, 7 were Upper Extremity, and 5 were Advanced Lower Extremity activities which appeared to assess gross and fine motor skills of the upper and lower body necessary for performing daily activities (walking, climbing stairs, transferring, handling and moving objects, stooping, and changing body position). The 20 items that loaded on Factor 2 contained 10 Advanced Lower Extremity, 9 Lower Extremity, and 1 Upper Extremity activities that seemed to represent endurance activities that required both muscle strength and power (running, walking a mile, climbing stairs, hiking, and high stepping). Finally, the eight items that loaded on Factor 3 contained five Lower Extremity, two Advanced Lower Extremity, and one Upper Extremity activities that represented activities requiring mostly muscle strength and some muscle power (climbing, balancing while reaching for an object, and transferring).

For the five items that loaded on all three Factors, four were Lower Extremity and one was Advanced Lower Extremity activities (climbing stairs, transferring, and carrying an object). Of the eight items that loaded on both Factor 1 and 2, four were Advanced Lower Extremity, three were Lower Extremity, and one was Upper Extremity activities (walking various distances and climbing stairs, changing body position, and moving an object). Two items loaded on both Factor 1 and Factor 3, and these activities appeared to require mostly muscle strength for balance (reaching over head and behind the back), and one item that loaded on both Factor 2 and Factor 3 seemed to require both muscle strength and power (getting up from lying on the floor). As a result, the 32 items of the Physical Function component did not cluster on the three subscales as expected. This did not diminish its validity as physical functioning activities do not specifically rely on discrete gross and fine motor skills of the lower or upper body, but a combination of both. For example, carrying objects in both arms requires the upper body to hold the object but needs the lower body to carry it. The same can be said for balancing while reaching an object, getting in and out of a low couch, and getting up from lying on the floor.

In contrast to current trends, obesity was not related to physical function in this sample of middle-aged, community-dwelling African American women. However, age and comorbidity were negatively associated with physical function, as expected, for the study did have a number of limitations. First, the study had a small sample size, which may have reduced the statistical power to detect some relations as significant. The findings, however, are still informative and support the criterion-related validity of the Physical Function component of the LLFDI. A second limitation was that the sample was recruited from only two local churches, and thus was likely to have selection and potential participation bias and may have resulted in a non-representative sample, thus minimizing the generalizability of the results. Future studies should include more diverse samples of middle-aged, community-dwelling African American women from various regions as obesity and comorbidity rates differ by geographic location, and their relation to physical function may vary with other characteristics. Also, African American women who live in warmer climates or in rural areas may be more active and have differences in physical function. Another limitation was the investigator-developed sociodemographic questionnaire as it restricted the comparison to other studies that used standard instruments. A final limitation was that the Physical Function component was compared to the PASE, which is a self-reported instrument based on a 7-day recall time frame and is limited by the participant's memory. Future studies should consider validating the Physical Function component with actual measures of physical activity, such as pedometers and accelerometers.

IMPLICATIONS FOR PRACTICE

The Physical Function component is a self-report instrument that can be easily administered during office visits by nurse practitioners and primary care physicians. The Physical Function component appears to be able to detect functional limitations in middle aged, community-dwelling African American women. Consequently, the Physical Function component can be a screening tool to identify those who are at risk or those beginning to experience functional limitations. Once identified, physical activity interventions can be suggested to correct or delay the limitations in physical function. Future recommendations include determining if the Physical Function component is sensitive enough to measure changes after completing physical activity interventions or to changes over time in middle aged, community-dwelling African American women.

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Table 1

Mean Scores for Physical Function Component, Subscales, PASE, 6-Minute Walk Test, Age, BMI, and Charlson Scale

Measure	Mean	SD	Range
Physical Function	69.8	15.0	37–100
Upper Extremity	86.1	15.8	41–100
Lower Extremity	81.3	17.6	41–100
Adv. Lower Extremity	63.9	18.8	18–100
PASE	165.9	76.9	28–521
6MWT (in feet)	1517.1	318.9	730–2659
Age (years)	58.7	11.0	36–82
BMI (kg/m ²)	32.2	6.8	21.0–51.7
Comorbidity	.84	1.4	0–7

PASE=Physical Activity Scale for the Elderly; 6MWT=6 minute walk test measured in feet; BMI=Body Mass Index; Comorbidity was scored using the Charlson Scale

Table 2

Correlations of Physical Function Component and three subscales with PASE, 6MWT, age, BMI, and Comorbidity Scale

Variables	1	2	3	4	5	6	7	8	9
1. Physical Function	-	-	-	-	-	-	-	-	-
2. Upper Extremity	.72**	-	-	-	-	-	-	-	-
3. Lower Extremity	.82**	.77**	-	-	-	-	-	-	-
4. Adv. Lower Extremity	.96**	.61**	.73**	-	-	-	-	-	-
5. PASE	.37**	.28**	.30**	.38**	-	-	-	-	-
6. 6MWT	.36**	.25**	.31**	.41**	.27**	-	-	-	-
7. Age	-.42**	-.22*	-.29**	-.46**	-.39**	-.41**	-	-	-
8. BMI	-.11	-.21	-.12	-.12	.08	-.15	-.21	-	-
9. Comorbidity	-.35**	-.33**	-.29**	-.35**	-.19*	-.19*	.15	-.03	-

* =significance at $p \leq 0.05$;** =significance at $p \leq .01$

Table 3

Items in Each Factor and Factor Loadings for the Physical Function Component (N=126)

% Variance Explained	Item	Subscale	Factor 1	Factor 2	Factor 3
.55.90	1	Unscrewing the lid of an unopened jar (U.E.)	.580	.473	
11.11	2	Going up and down stairs, inside with handrail (L.E.)	.733	.626	-.526
3.75	3	Putting on and taking off long pants (U.E.)	.846	.398	
2.79	4	Running ½ mile or more (A.E.)		.623	
2.60	5	Using common utensils for preparing meals (U.E.)	.825		
2.43	6	Holding a full glass of water in one hand (U.E.)	.737		
2.35	7	Walking a mile, taking rests as needed (A.E.)	.557	.731	-.327
2.06	8	Going up and down stairs outside without rail (A.E.)	.652	.752	-.488
1.68	9	Running a short distance to catch a bus (A.E.)	-.468	.824	-.377
1.66	10	Reaching overhead while standing to pull a cord (L.E.)	.703	.409	-.550
1.48	11	Sitting down in and standing from a low couch (L.E.)	.621	.697	-.605
1.30	12	Putting on and taking off a coat or jacket (L.E.)	.867	.344	-.434
1.14	13	Reaching behind your back, belt through a loop (U.E.)	.760	.467	-.654
1.12	14	Stepping up and down from a curb (L.E.)	.759	.573	-.656
.97	15	Opening a heavy, outside door (L.E.)	.693	.562	-.621
.86	16	Rip open a package of snacks with hands (U.E.)	.806	.509	-.336
.82	17	Pouring from a large pitcher (U.E.)	.853	.489	-.387
.78	18	Getting into and out of a car/taxi (L.E.)	.856	.515	-.489
.68	19	Hiking a couple of miles on uneven surfaces (A.E.)		.760	
.63	20	Going up and down 3 flights of stairs with rail (A.E.)	.563	.805	
.54	21	Picking up and moving a kitchen chair (L.E.)	.872	.538	-.428
.48	22	Using a step stool to reach into a high cabinet (L.E.)	.735	.500	-.406
.44	23	Making a bed by spreading and tucking sheets (L.E.)	.851	.333	
.41	24	Carrying something in both arms climbing stairs (A.E.)	.546	.748	-.573
.37	25	Bending over from a standing position (L.E.)	.790	.629	-.457
.36	26	Walking around one floor of your home (L.E.)	.865	.483	-.387
.30	27	Getting up from laying on the floor (A.E.)	.465	.789	-.599
.28	28	Washing dishes, pots, and utensils by hand (L.E.)	.838	.326	
.25	29	Walking several blocks (A.E.)	.733	.766	

% Variance Explained	Item	Subscale	Factor 1	Factor 2	Factor 3
.21	30	Taking a 1 mile brisk walk without stopping (A.E.)	.393	.815	
.18	31	Stepping on and off a bus (L.E.)	.455	.715	
.11	32	Walking on a slippery surface outdoors (A.E.)	.395	.657	

U.E.=Upper Extremity; L.E.= Lower Extremity; and A.E.=Advanced Extremity

Factor loadings > .50 are in bold